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DEPARTMENT OF COMMERCE
BUREAU OF FOREIGN AND DOMESTIC COMMERCE
E. E. PRATT, Chief

MISCELLANEOUS SERIES—No. 54

CANNED FOODS

MODERN PROCESSES OF CANNING IN THE UNITED STATES, GENERAL SYSTEM OF GRADING, AND DESCRIPTION OF PRODUCTS AVAILABLE FOR EXPORT

PRICE, 20 CENTS
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LETTER OF SUBMITTAL.

DEPARTMENT OF COMMERCE,
BUREAU OF FOREIGN AND DOMESTIC COMMERCE,
Washington, June 1, 1917.

SIR: There is submitted herewith a bulletin on canned foods, prepared by Dr. A. W. Bitting, through the cooperation of the National Canners' Association, in which are described the processes employed in the commercial canneries of the United States, the general system of grading followed, and the character of the products that are available for export.

The American canning industry is the largest in the world, and the development of an increased export trade depends to a great degree upon the education of people in foreign countries to the variety and wholesomeness of American canned foods. The distribution of this bulletin by American canners and exporters to foreign buyers should prove an effective means of trade promotion.

Respectfully,

E. E. PRATT, *Chief of Bureau.*

To Hon. WILLIAM C. REDFIELD,
Secretary of Commerce.

CANNED FOODS:

Modern Processes of Canning in the United States, General System of Grading, and Description of Products Available for Export.

INTRODUCTION.

The art of preserving foods through rendering them sterile by means of heat and maintaining them in that condition in a hermetically sealed container was given to the world by Nicholas Appert, of Chalons-on-the-Marne, France, in 1810. His discovery was no mere accident but the result of great industry through a period of 15 years, beginning in 1795. He was a man of exceptional ability and had a broad experience in food preparation before beginning this work. The results of his first experiments, covering several years, were nearly all failures, but he persisted and finally mastered the principles, giving to his fellow men a technique so simple, and withal so safe, that even the inexperienced have been able to follow his directions with marked success. The work done since his time has been chiefly in the nature of improved mechanical methods of preparation of the product, in filling and sealing the cans, and in securing greater uniformity and precision in processing.

The canning industry started in France and in the British Isles almost simultaneously and was brought to the United States soon after, where it has attained its highest development. This form of food preservation was conceived primarily as a military measure to secure better stores for the army and navy, in order to avoid the enormous losses attendant upon the methods then in use. The improved quality attained and the convenience resulting attracted attention immediately to the advantages to be derived from the use of similarly prepared foods for household consumption, but the crude methods of making cans and the hand labor involved in every step of food preparation made the cost excessive. Canned foods were looked upon as delicacies, condiments, or confections, and available only to those of considerable wealth.

Very little progress was made in the canning industry in the United States prior to 1855, the principal pack being sea food, which in a fresh condition could not be transported inland with safety. At that time the cities were small, and fruits and vegetables of all kinds were grown in their immediate vicinity and delivered fresh by wagon. There was not the same demand for something out of season or from other lands that has developed later, and aside from this, living conditions were not such as to compel the use of foods in concentrated form and free from waste.

It was not until the close of the following decade, the period of the Civil War, that the superiority of canned foods over those which were dried, salted, and pickled became common knowledge. The soldiers in detention camps and hospitals, though meagerly supplied with canned foods, learned of their excellence and value and later carried the information to every section. Subsequent to this period domestic and commercial canning increased constantly, though somewhat slowly, because of a newly acquired popular prejudice that had to be broken down, and, in addition, economical methods of manufacture had to be developed.

At the present time the United States is not only the largest producer of canned foods in the world, but likewise the largest consumer. The industry has been developed upon the principle that the foods go to the consumer in the most attractive and palatable form, are convenient for holding in any place and for a reasonable time, and being sterile are therefore always safe. In addition to these facts, all waste and cost of preliminary preparation are eliminated. The foods packed are no longer limited to delicacies, to fruits or vegetables to extend their use out of season, or to marine products to make them available to the interior of the country, but the method has been extended to the packing of thousands of tons of such articles as hominy, white and kidney beans, kraut, and sweet potatoes, foods which are cheap and which have previously been sold in bulk. Millions of tins of milk are being packed because it is recognized that the canned milk is safer than that of the average fresh delivery, and a like quantity of soup is packed because it is possible to get better material in large quantities at the factories than in the small amounts made in the home. The great factor behind all of this is economy to the consumer. Canning contributes further to a wider range in the dietary than would otherwise be possible, and thus has stimulated a desire for foreign products to the extent that we have become large importers. It also makes available the preparations of skilled chefs in homes where crude cookery would otherwise prevail.

The history of the canning industry in the United States dates back to 1819, when Ezra Daggett and Thomas Kensett packed a few salmon, lobsters, and oysters in New York. In the succeeding year William Underwood and Charles Mitchell packed damsons, quinces, cranberries, and currants in Boston. Canning was started in Baltimore in 1840 and in Eastport, Me., on fish, in 1841. Small canneries then sprang up all along the coast, using marine products as their principal article, these being supplemented by fruits and vegetables in season. The industry was started on the Pacific coast, at San Francisco, in 1856, and in Alaska in 1878.

The canning of certain products is largely regional, as might be expected in a country as large as the United States. Corn is packed principally in Maine, Maryland, New York, Ohio, Indiana, Illinois, Iowa, and Minnesota. Peas are packed in New York, Michigan, Wisconsin, Minne-

sota, Illinois, Indiana, Ohio, Maryland, Colorado, and California. Beans are packed in New York, Michigan, Wisconsin, California, and Maryland. The tomato is packed over a wider area than any other product, most largely, however, in New Jersey, Delaware, Maryland, Virginia, New York, Ohio, Indiana, and California. The fruits are packed in New York, Ohio, Michigan, and California. Meats are packed only at the large slaughtering centers, as Chicago, Omaha, and Kansas City. Milk is packed in New York, Pennsylvania, Ohio, Indiana, Illinois, Wisconsin, and California. Salmon is packed in Oregon, Washington, and Alaska; tuna in California; sardines and clams in Maine; crabs in Virginia; oysters from Maryland to Savannah on the Atlantic coast and from Apalachicola west as far as Louisiana on the Gulf of Mexico; and shrimp on the Gulf coast and as far north as Georgia on the Atlantic. The most diversified packing is carried on in California, as the climatic conditions are peculiarly favorable for producing almost every known fruit and vegetable. California is in the same latitude as southern Europe. The whole of France and the northern part of Italy and Spain lie north of its northern boundary, which is almost in line with Constantinople, while the southern boundary, almost 800 miles south, is nearly due west from Cairo. The high mountains in the north and east, the desert in the south, and the ocean on the west give a variety in climate that permits the development of products of the temperate and tropical zones.

Canning has developed into a special industry in the United States, as much so as milling or brewing. It has long since passed the stage of being an adjunct to the kitchen in preparing a few dozen jars of some product for home consumption, or as an accessory to a fresh market in caring for the surplus. It has a distinctive place, requiring the growing of suitable crops and necessitating their harvesting, when in prime condition, in such a manner as to insure quick delivery to the factory without injury; the feeding of herds and the care of milk in a manner to produce uniformity in quality and to comply with the highest standards of cleanliness; and the maintenance of especially equipped fleets for catching and delivering fish. Machinery of the most complicated character has been developed to do nearly every operation of preparation, filling, and processing, and thus to reduce handwork to the minimum. The investment required for the equipment of even a small factory may amount to a few thousand dollars, but for the larger ones it may easily exceed a hundred thousand dollars.

EXTENT OF CANNING INDUSTRY.

The extent of the American canning industry is shown by the following figures, obtained from the Bureau of the Census, the Bureau of Fisheries, and trade organizations known to be reliable, giving the number of cases of different products packed in 1914.

FRUITS.

Apples (24 No. 3 cans):	Cases.
Arkansas	48,435
California	110,672
Colorado	20,093
Maine	55,924
Maryland	87,570
Michigan	140,516
Missouri	12,971
Nebraska	3,415
New York	805,499
North Carolina	25,430
Ohio	614
Oregon	25,223
Pennsylvania	92,745
Virginia	22,656
Washington	33,745
All other States	29,431
Total	1,514,939

Apricots (24 No. 3 cans):	
California	1,005,234
Utah	46,496
All other States	86
Total	1,051,816

Blackberries (24 No. 2 cans):	
Arkansas	6,032
California	142,138
Maryland	28,297
Michigan	9,624
New Jersey	21,552
New York	3,258
North Carolina	80,343
Ohio	6,672
Tennessee	29,899
Texas	6,478
Virginia	10,140
Washington	93,768
All other States	13,960
Total	452,161

Blueberries (24 No. 2 cans):	
Maine	116,001
Maryland	8,379
Michigan	6,357
Vermont	10,486
Washington	9,907
All other States	506
Total	151,636

Cherries (24 No. 2 cans):	Cases.
California	131,252
Colorado	8,835
Idaho	11,959
Maryland	31,492
Michigan	45,699
New York	214,265
Ohio	11,801
Oregon	43,121
Utah	17,272
Washington	21,022
All other States	6,495
Total	543,213

Figs (24 No. 3 cans):	
Louisiana	4,655
Mississippi	1,429
Texas	12,969
All other States	1,552
Total	20,605

Gooseberries (24 No. 2 cans):	
Maryland	42,763
Michigan	28,999
New York	7,684
Oregon	3,459
All other States	6,688
Total	89,593

Grapes (24 No. 3 cans):	
California	63,697
All other States	508
Total	64,205

Peaches (24 No. 3 cans):	
Arkansas	4,903
California	2,922,637
Georgia	76,782
Maryland	201,742
Michigan	110,391
New York	9,072
North Carolina	9,070
Ohio	5,615
Tennessee	8,303
Utah	20,955
Washington	6,294
All other States	32,142
Total	3,407,906

Pears (24 No. 3 cans):	Cases.
California	672, 782
Delaware	17, 931
Maryland	156, 166
Michigan	7, 345
New Jersey	57, 667
New York	94, 247
Oregon	20, 838
Utah	4, 777
Washington	25, 850
All other States	5, 159
Total	1, 062, 762

Pineapples (24 No. 3 cans):	
Maryland	68, 259
New York	25, 879
Hawaii (No. 2½ cans)	2, 262, 000
All other States	2
Total	2, 356, 140

Plums (24 No. 2 cans):	
California	150, 216
Michigan	31, 126
New York	72, 106
Oregon	10, 699
Washington	16, 834
All other States	7, 345
Total	288, 326

Raspberries (24 No. 2 cans):	Cases.
California	3, 445
Illinois	2, 574
Maryland	9, 728
Michigan	67, 142
New York	199, 230
Ohio	9, 453
Oregon	29, 641
Washington	89, 738
All other States	3, 681
Total	414, 632

Strawberries (24 No. 2 cans):	
California	19, 615
Maryland	63, 878
Michigan	23, 940
New Jersey	4, 050
New York	39, 490
Oregon	15, 194
Washington	17, 564
All other States	2, 188
Total	185, 919

Other canned fruits (24 No. 2 cans):	
California	34, 856
Oregon	34, 648
Washington	7, 773
All other States	9, 573
Total	86, 850

VEGETABLES.

Asparagus (24 No. 2 cans):	Cases.
California	620, 859
Illinois	6, 300
New York	8, 563
All other States	1, 879
Total	637, 601

Beans, baked (24 No. 2 cans):	
California	29, 615
Colorado	12, 109
Connecticut	15, 050
Illinois	481, 088
Indiana	1, 396, 614
Iowa	40, 786
Maine	252, 737
Maryland	387, 495
Michigan	708, 376
New Jersey	1, 253, 129
New York	35, 462

Beans, baked—Continued.	Cases.
Ohio	450, 905
Pennsylvania	826, 883
Utah	18, 949
Vermont	32, 665
Wisconsin	32, 052
All other States	3, 468
Total	5, 977, 383

Beans, string (24 No. 2 cans):	
California	78, 233
Colorado	134, 997
Indiana	13, 305
Kentucky	12, 619
Maine	37, 207
Maryland	277, 959
Michigan	95, 381
Minnesota	3, 974
New York	705, 220

Beans, string—Continued.	Cases.
North Carolina	6,559
Ohio	27,083
Oregon	9,292
Pennsylvania	96,292
Tennessee	42,216
Utah	48,835
Vermont	16,494
Virginia	14,774
Washington	10,643
Wisconsin	139,014
All other States	19,927
Total	1,790,024

Beans, Lima (24 No. 2 cans):	
California	31,735
Illinois	15,797
Indiana	100
Maine	9,037
Maryland	22,922
Michigan	68,710
New Jersey	220,442
New York	23,096
Ohio	29,340
Virginia	12,660
All other States	9,645
Total	443,484

Beans, all other kinds (24 No. 2 cans):	
California	15,299
Illinois	248,552
Indiana	181,972
Iowa	20,057
Maine	20,639
Maryland	23,649
Michigan	50,201
New York	151,664
Ohio	41,822
Wisconsin	22,259
All other States	7,297
Total	783,411

Beets (24 No. 3 cans):	
Maryland	15,333
New Jersey	15,068
New York	93,517
Ohio	31,402
Pennsylvania	20,107
Wisconsin	58,086
All other States	18,119
Total	251,632

Corn (24 No. 2 cans):	Cases
Delaware	215,280
Illinois	1,535,215
Indiana	668,443
Iowa	1,530,154
Maine	1,101,333
Maryland	1,482,093
Michigan	138,185
Minnesota	274,193
Missouri	3,021
Nebraska	225,801
New Hampshire	31,961
New York	769,562
Ohio	1,167,063
Pennsylvania	207,152
Tennessee	36,964
Vermont	157,111
Virginia	1,584
Wisconsin	349,542
All other States	25,293
Total	9,919,950

Hominy (24 No. 3 cans):	
Colorado	25,868
Illinois	120,474
Indiana	456,591
Iowa	20,595
Maryland	8,632
Ohio	13,185
Tennessee	38,167
Utah	1,988
All other States	600
Total	686,100

Kraut (24 No. 3 cans):	
California	4,032
Colorado	84,372
Illinois	80,280
Indiana	359,619
Iowa	17,606
Maryland	39,628
Michigan	54,307
Minnesota	8,440
New York	195,069
Ohio	161,502
Tennessee	11,902
Wisconsin	145,401
All other States	22,061
Total	1,184,219

Peas (24 No. 2 cans):	Cases.
California	165, 540
Colorado	278, 990
Delaware	178, 810
Illinois	434, 615
Indiana	434, 411
Maryland	564, 442
Michigan	490, 131
Minnesota	83, 355
New Jersey	85, 512
New York	1, 957, 737
Ohio	259, 837
Pennsylvania	63, 587
Utah	334, 144
Virginia	17, 540
Wisconsin	3, 421, 125
All other States	56, 508
Total	8, 826, 284

Pumpkin (24 No. 3 cans):	
California	7, 944
Colorado	32, 412
Delaware	6, 670
Illinois	70, 016
Indiana	304, 150
Iowa	34, 963
Kentucky	7, 729
Michigan	14, 209
Minnesota	5, 662
Missouri	1, 004
New Jersey	60, 167
New York	84, 292
Ohio	102, 279
Pennsylvania	10, 214
All other States	47, 657
Total	789, 368

Sweet potatoes (24 No. 3 cans):	
Alabama	1, 794
Delaware	39, 093
Georgia	1, 466
Louisiana	18, 008
Maryland	131, 451
Mississippi	65, 872
New Jersey	24, 936
Tennessee	9, 943
Virginia	133, 463
All other States	28, 389
Total	454, 415

Spinach (24 No. 3 cans):	Cases.
California	23, 755
Maryland	282, 795
New York	52, 596
Ohio	15, 450
All other States	17, 194
Total	391, 790

Squash (24 No. 3 cans):	
California	21, 163
Maine	25, 172
Maryland	7, 317
Michigan	24, 778
New Jersey	45, 624
New York	19, 819
All other States	21, 809
Total	165, 682

Succotash (24 No. 2 cans):	
Maine	33, 547
Maryland	24, 585
Michigan	55, 208
New York	115, 427
Ohio	19, 249
All other States	22, 061
Total	270, 077

Tomatoes (24 No. 3 cans):	
Arkansas	152, 536
California	1, 730, 487
Colorado	149, 363
Connecticut	46, 515
Delaware	1, 326, 275
Illinois	74, 850
Indiana	1, 172, 670
Iowa	165, 338
Kentucky	111, 789
Maryland	6, 656, 810
Michigan	141, 449
Missouri	366, 331
New Jersey	695, 218
New York	563, 400
North Carolina	11, 444
Ohio	508, 829
Pennsylvania	218, 105
Tennessee	165, 524
Texas	518
Utah	696, 257
Virginia	1, 025, 477
West Virginia	115, 720

Tomatoes—Continued.	Cases.
Wisconsin	14,945
All other States	90,452
Total	16,200,302

Tomato pulp (12 No. 10 cans):	
California	15,205
Colorado	8,972
Delaware	66,361
Indiana	325,398
Maryland	72,841
Michigan	38,358
New Jersey	105,001
New York	21,178
Ohio	60,777
Pennsylvania	8,167
Utah	11,128
All other States	18,765
Total	752,151

Okra and tomatoes (24 No. 3 cans):	
Louisiana	17,895
Maryland	9,001
South Carolina	1,741
Virginia	434
All other States	4,971
Total	34,042

All other vegetables (24 No. 3 cans):	
California	44,314
Illinois	67,545
Indiana	119,375
Louisiana	29,030
Maine	8,911
Maryland	57,887
Michigan	360
New Jersey	19,873
New York	62,032
Ohio	7,026
Pennsylvania	208,272
Tennessee	147
Texas	57,669
Wisconsin	5,054
All other States	13,264
Total	700,759

FISH AND OYSTERS.

Clams (48 No. 1 cans):	Cases.
Florida	6,197
Maine	94,813
Oregon	11,690
Virginia	14,874
Washington	53,000
All other States	4,612
Total	185,186

Clam bouillon (48 No. 1 cans):	
Florida	30,960
All other States	14,254
Total	45,214

Clam chowder (24 No. 3 cans):	
Florida	11,067
Maine	86,771
North Carolina	5,000
Total	102,838

Oysters (48 No. 1 cans):	
California	24,870
Florida	16,172
Georgia	35,902
Louisiana	78,516
Maryland	433,440
Mississippi	196,047
North Carolina	33,795
South Carolina	118,416
Virginia	7,429
All other States	52
Total	944,639

Salmon (48 No. 1 cans):	
California	40,430
Oregon	376,492
Washington	1,096,366
All other States	12
Alaska	4,056,653
Total	5,569,953

Sardines (48 No. ¼ cans):	
California	302,736
Maine	4,634,424
Massachusetts	75,027
All other States	12
Total	5,012,199

Shrimp (48 No. 1 cans):	Cases.
Georgia	26,014
Louisiana	162,005
Mississippi	266,021
All other States	5,837
Total	459,877

Tuna (48 No. ½ cans):	Cases.
California	437,090
All other canned fish:	
All States	87,761

OTHER PRODUCTS.

Milk (48 lbs. per case):	Cases.
Illinois	3,488,023
Indiana	293,910
Iowa	136,969
Kansas	213,182
Maryland	81,270
Michigan	1,594,055
New Jersey	166,266
New York	2,741,138
Ohio	1,052,289
Oregon	482,446
Pennsylvania	1,452,269
Utah	369,354
Vermont	351,824
Washington	1,774,316
Wisconsin	3,118,386
Milk—Continued.	Cases.
All other States	880,355
Total	18,196,052
Meat (27 lbs. per case):	
Illinois	4,186,937
Kansas	444,909
Nebraska	48,317
New York	520,444
All other States	754,909
Total	5,955,516
Sausage (26 lbs. per case):	
All States	2,846,322
Soups (24 No. 1 cans):	
All States	4,886,098

RECAPITULATION.[a]

Fruits:	Cases.	Value.
Apples	1,514,939	$2,392,289
Apricots	1,051,816	3,060,626
Blackberries	452,161	788,614
Blueberries	151,636	320,508
Cherries	543,213	1,628,975
Figs	20,605	159,522
Gooseberries	89,593	142,876
Grapes	64,205	110,995
Peaches	3,407,906	9,585,773
Pears	1,062,762	3,853,700
Pineapples	2,356,140	5,642,250
Plums	288,326	438,238
Raspberries	414,632	1,137,207
Strawberries	185,919	557,519
Other canned fruits	86,850	356,082
Vegetables:		
Asparagus	637,601	2,790,817
Beans, baked	5,977,383	11,535,047
Beans, string	1,790,024	3,060,330
Beans, lima	443,484	904,050
Beans, all other	783,411	1,065,594
Beets	251,632	511,900

[a] Valuation figures are from reports of the Bureau of the Census, except for pineapples packed in Hawaii and salmon packed in Alaska. Statistics of the Alaska salmon pack are from reports of the Bureau of Fisheries.

Vegetables—Continued.	Cases.	Value.
Corn	9,919,950	$13,923,057
Hominy	686,100	712,991
Kraut	1,184,219	1,567,717
Peas	8,826,284	15,089,047
Pumpkin	789,368	1,023,008
Sweet potatoes	454,415	736,759
Spinach	391,790	736,686
Squash	165,682	294,409
Succotash	270,077	455,956
Tomatoes	16,200,302	25,532,217
Tomato pulp	752,151	1,454,051
Okra and tomatoes	34,042	75,946
All other vegetables	700,759	2,944,085
Fish and oysters:		
Clams	185,186	670,363
Clam bouillon	45,214	80,867
Clam chowder	102,838	386,998
Oysters	944,639	2,676,951
Salmon	5,569,953	27,633,284
Sardines	2,100,000	6,238,933
Shrimp	459,877	1,725,621
Tuna	437,090	1,638,675
All other canned fish	87,761	269,901
Other products:		
Milk	18,196,052	58,747,252
Meat	5,955,516	26,417,624
Sausage	2,846,322	9,845,669
Soups	4,886,098	7,877,057
Total	103,765,923	258,798,036

PROCESS OF CANNING.

The steps in canning vary with the different products, but there are certain processes common to all, as collecting the product, grading for quality, washing, preparing, filling the cans, sealing, processing, and cooling.

RAW MATERIAL.

Only prime raw material can be used in canning to obtain a first-class product. This is of so much importance that nearly all canners grow or contract for their supplies that they may be of a certain quality, be harvested at the direction of the factory superintendent, and be delivered without injury immediately after cutting or picking. This is so well established that the factories are located as near as possible to the source of supply. Labor is transported to the factory, if necessary, rather than the material transported a long distance to labor. Peas lose their delicacy in a few hours after cutting, corn loses its sweetness, beans become tough and stringy, and asparagus acquires a bitter taste. The object is to get the fruits and vegetables into the can before they undergo any appreciable deterioration. Material of the grade found in the fresh markets in cities

is unsuitable for high-grade products. Milk is produced by large herds and is kept under a better system of inspection and control than is the average fresh milk delivered in towns and cities. No meats may be used in canning or in soup that are not Government inspected, nor may they be manufactured under conditions not approved by the Government inspector. The fish packers employ their own fleets in order to have prompt delivery, regardless of whether the catch be large or small. The fact that nearly all of the products are in a most perishable state when used makes it imperative that the packer's supervision go beyond the factory; in fact, it is exercised to the very source of production.

The most recent type of fish cannery, used for both salmon and tuna. The cannery is floated to a point near the fishing grounds.

PREPARATION.

The sequence of steps necessary for the preparation of a food depends wholly upon the product. In general, however, the superintendent attempts to make a gross grading when each load is delivered. The varieties are kept separate, and materials of the same kind but in different stages of maturity or showing marked variation in size or quality are handled separately. Careful grading is followed at nearly every step until the product is placed in the can, and this phase is emphasized from the start. Some of the fruits need little preparation other than picking out foreign matter and defective material, whereas others require peeling, pitting, coring, and sizing. Some vegetables require more work than do

the fruits, as thrashing peas from the vines, husking and silking corn and cutting it from the cob, snipping and stringing beans, peeling beets, potatoes, etc. A great deal of this work is done by machinery and better than it can be done by hand. Peaches are peeled by lye; peas are thrashed by a machine at a speed greater than could be attained by a hundred hands, and with a minimum of injury to the product; corn is husked, silked, and cut without hand labor other than feeding the ears to the machine, which is done at the rate of a hundred or more a minute. The work upon asparagus and beans, however, is almost all hand labor, as no machinery has yet been devised that will satisfactorily handle them.

Grading olives. The olives are carried on a belt in front of the inspectors. Essentially the same method is used in grading for quality in all lines.

GRADING.

Grading to secure uniformity in a product, in both appearance and quality, is a necessity in all high-class packing. Sometimes it would seem that this is being carried to excess when it is realized that there are 10 or 12 grades of peas and an equal number of grades of apricots, 15 to 18 grades of peaches, and 10 grades of cherries. Grading for size is very largely mechanical; fruits are passed over screens having standard openings, peas are sifted through perforated cylinders, and beans are graded

for thickness over vibrating rolls, and later cut to standard length. Grading for quality, for uniform texture, for color, etc., can not be done by machines, but requires handwork. As far as possible, this work is done in the early stages so as to eliminate the handwork after the washing has been done.

A machine for grading peaches for size. The same principle is used for all fruits except pears.

WASHING.

The washing that all products receive in a factory is far more thorough than that which is given in the home kitchen. The packing of peas, which may be considered typical of the principal products, requires nearly 1 gallon of water in the preparation of each can. Washing

machines of seemingly every conceivable type are in use; there are various forms of troughs provided with currents of water to agitate the product, thus loosening and removing the dirt; there are perforated cylinders and conveyors working between sprays of large volume which rinse off the dirt, and other sprays under pressure cut and remove the more adherent dirt. Some products are washed several times, as before and after blanching or grading.

The washing extends to the machines and cans, and at present mechanical washers are becoming common in cleaning the buckets and pans after each operation, no matter how many times they may be used during the day.

BLANCHING.

Many vegetables and some fruits are given a brief forecooking in hot water, the operation being termed "blanching." In the case of asparagus, beans, peas, etc., the object is to remove the sticky or gummy substance from the surface, and also to cause a certain amount of softening that is not only necessary for the handling in the case of asparagus but considered desirable as influencing edible quality. In the case of peaches, cherries, and other fruits, it is for the purpose of securing a degree of flexibility, so as to enable better packing in the can and to produce a greater uniformity of color. The object is not to whiten, as many persons have assumed.

FILLING THE CANS.

The majority of fruits are filled into cans by hand, owing to the fact that they must be layered, more or less, to get the proper degree of filling. A definite number of peaches or pears can not be placed in a can by a machine, so as to get a uniform filling or weight without crushing or injury. All fruits are filled by weight. The reverse is true for most vegetables; corn, peas, baked beans, hominy, pumpkin, squash, and most tomatoes are filled by volume, the work being done by machines. String beans are partially filled by machine, and the weight corrected by supplemental hand filling. Asparagus and sweet potatoes are hand filled. Milk and soups are machine filled. A large part of the salmon pack is machine filled, but sardines and tuna are layered by hand. Potted or ground meats are machine filled, but cuts or pieces like tongue are hand packed.

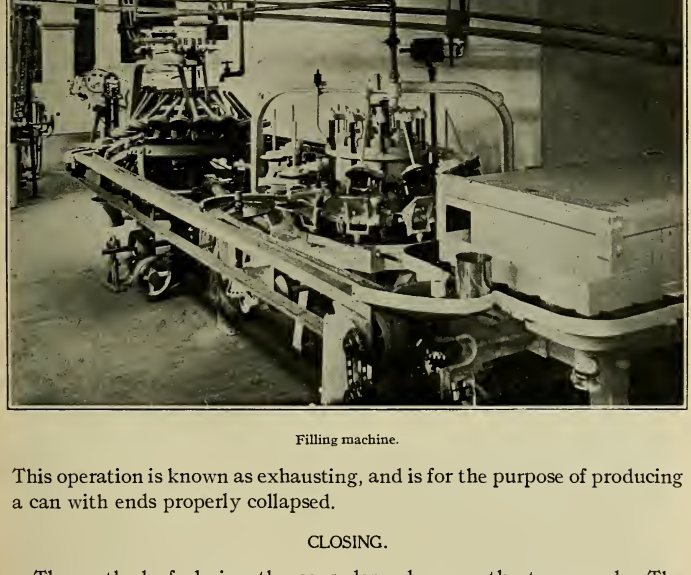
SIRUPING AND BRINING.

Nearly all products have a sirup or brine added. All high-grade fruits require a sirup, the degree of the sirup becoming as much a part of the grade as the quality of the fruit. Only the lowest grade is packed in water. The vegetables require a salt or a sweet brine, the latter being made with a mixture of salt and sugar. The quantity of sirup or brine used is only that deemed necessary for the proper preservation of the product. Some products, like tomatoes, squash, pumpkin, etc., do not

need the addition of any liquid. Nothing is added to salmon except dry salt; tuna may have salt and olive oil; and sardines may have a mustard or tomato sauce, or oil. Meat jelly is generally added to meats. Where sirup and brine are used, they are added by machinery, after the other product has been placed in the can.

EXHAUSTING.

After the cans are filled, they are heated gradually to partially drive out the air, or they may be sealed in a chamber under partial vacuum.



Filling machine.

This operation is known as exhausting, and is for the purpose of producing a can with ends properly collapsed.

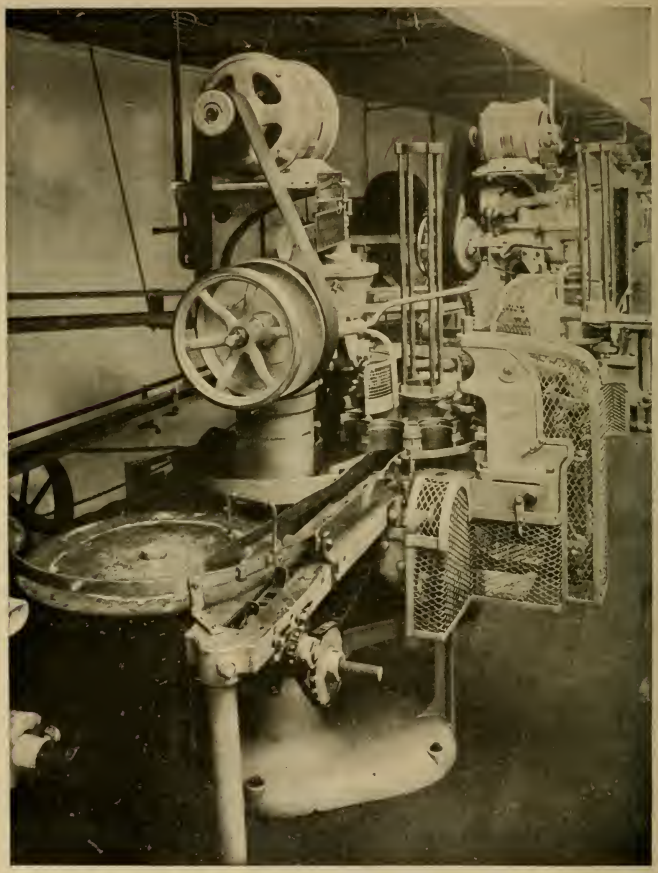
CLOSING.

The method of closing the cans depends upon the type used. The solder-top cans are sealed by automatic machines, which wipe the tops, place the caps, apply the flux, heat the solder, and close the vent without the introduction of hand labor. The hand soldering copper or capping steel is to be found in only the smallest plants and then usually for patching purposes.

The open-top can is closed by automatic machinery which places the cover in position and crimps the edge to the body of the can by means of heavy rolls. No acid or solder is used, but a cement substance or paper gasket is interposed between the laps of tin.

PROCESSING.

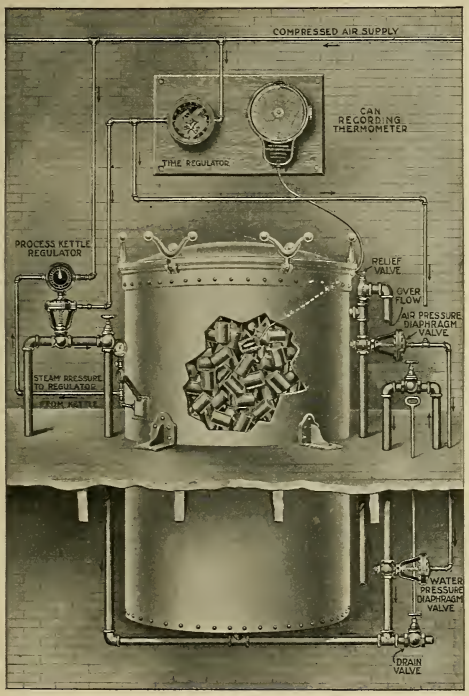
The final act of sterilizing the cans is known as the process, and may be carried on below, at, or above the boiling temperature, depending upon



A can-closing machine. The cover is crimped onto the body.

the material. When done below or at the boiling temperature, open water baths are generally employed and the temperature controlled by some adequate device. When carried out above the boiling point, the work is accomplished in retorts or autoclaves in water or in steam under

pressure. By means of the latter any suitable temperature can be obtained. Fruits do not need a temperature above the boiling point; most vegetables can not be processed in one operation with safety at boiling; and milk, fish, and meats require temperatures from 235° to 250° F. (112.5° to 121° C.). The time depends upon the fluidity of the material, as the heat will penetrate quickly if free liquid, brine, or sirup be present, but slowly if the product be fairly heavy or solid. The heat

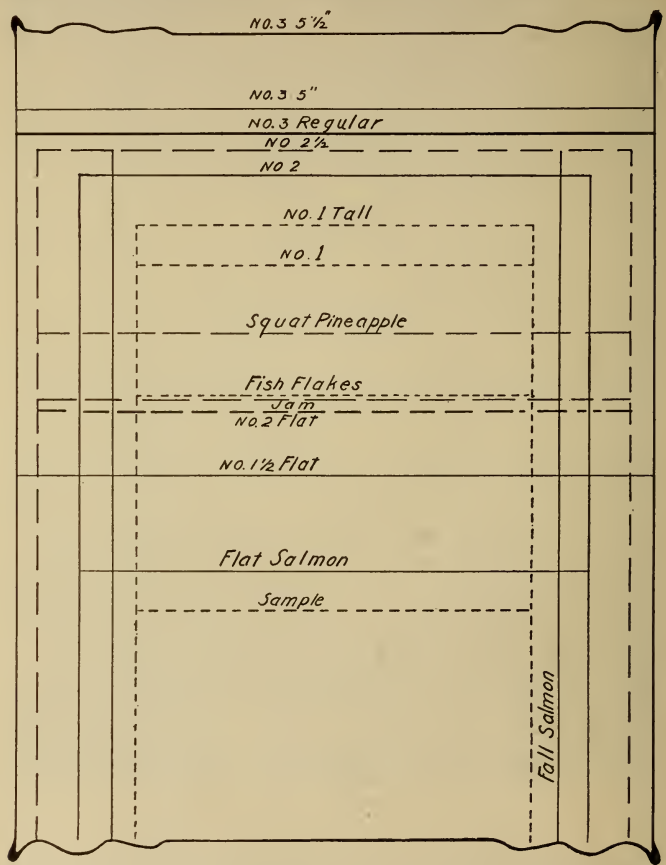


A typical retort or cooker with regulators for automatically controlling the temperature, fixing the time, and cooling the product when finished.

penetration may be greatly aided by rolling or turning the can, thus agitating the contents. The process necessarily depends upon two factors—the resistance of the organisms to heat, and the nature of the material, as the latter must be cooked to the proper degree, but without injury by too high or prolonged heating. It is upon the use of the proper process that quality depends.

COOLING.

The final step is the cooling of the cans, which is done to prevent prolonged cooking of the product. Different methods are used, as turning cold water into the retort or cooker, removing the cans from the cooker to a cooling tank, spraying the cans in the open, stacking the cans in trays so that air may circulate freely and the cans cool slowly. The method depends largely upon the product and the effect desired.



An outline in full size of the principal size of cans used. The individual service or sample can holds slightly more than 4⅓ ounces (135 c. c.); flat salmon, 8 ounces (240 c. c.); No. 1½ flat, 17 ounces (500 c. c.); No. 2 flat, 18⅓ ounces (540 c. c.); jam, 20 ounces (590 c. c.); fish flakes, 8½ ounces (250 c. c); special squat pineapple, 22 ounces (640 c. c.); No. 1, 10½ ounces (310 c. c.); No. 1, tall, 11⅓ ounces (335 c. c.); No. 2, 20⅓ ounces (600 c. c.); No. 2¼, 29 ounces (860 c. c); No. 3, 34⅓ ounces (1,015 c. c.); No. 3, 5 inches, 35 ounces (1,040 c. c.); and No. 3, 5½ inches, 39 ounces (1,160 c. c.).

THE CONTAINER.

There are two styles of containers in use, known as the hole-and-cap can and the open-top, or sanitary, can. The former is the older and is sealed by means of solder. In the latter the entire end of the can is applied after the filling is done and the closure made by crimping or double seaming the end to the body, no acid or solder being used. Instead of solder, a form of cement or a paper gasket is used to assist in making a tight closure. This style of can is rapidly superseding the older form because of the ease with which it may be cleaned, filled, and closed.

The containers are also classed as plain and lacquer lined. The latter are used in packing products that have considerable color, as berries, beets, etc., to prevent the bleaching effect induced by their action upon the plain tin. A few products, as shrimp, crab meat, some tuna, and fish flakes, are packed in paper-lined cans for the purpose of preventing any dark spots through contact of the contents with the metal. Wood and other liners have been used, but paper has nearly superseded all others. Outside lacquering is generally done upon goods to be exported, or upon those likely to be exposed to dampness or salt air, to prevent rusting. A great variety of sizes of cans are in use, so that one may get a product in almost any quantity, from the individual service (130 cc.) to about 1 gallon (3.8 liters.)

The variety in shapes and the seeming confusion of sizes has developed in three ways. First, the cans were made to utilize a standard sheet of metal with the minimum of waste by the method of can making in vogue at the time. This resulted in cans of arbitrary volume, bearing no definite relation to standards of volume, like the pint, quart, or gallon, and unfortunately they did not bear a very close relationship to the quantity that would be consumed at a single meal by an average family. A size of package was started, however, which has persisted because of a fixture in trade and the expense in changing machinery, cans, shipping cases, etc. Secondly, was the introduction of sizes to fit a given weight of a certain product. This has been particularly true of meat products, as 4, 8, 12, and 16 ounce cans. The sizes that will hold these weights of a ground meat will not hold the same quantity if cereal be added or if large cuts or pieces. The weights have been kept constant and the size changed to meet the varying products. The shape of the cans of the same capacity has likewise been changed to enable perfect packing of the product. Tongue, for example, could not be packed in a tall salmon can and preserve the shape and appearance so much desired. Thirdly, is the attempt to make cans that will hold a quantity of a given article to retail at a popular price, like 10 cents. This applies especially to soup, beans, etc.

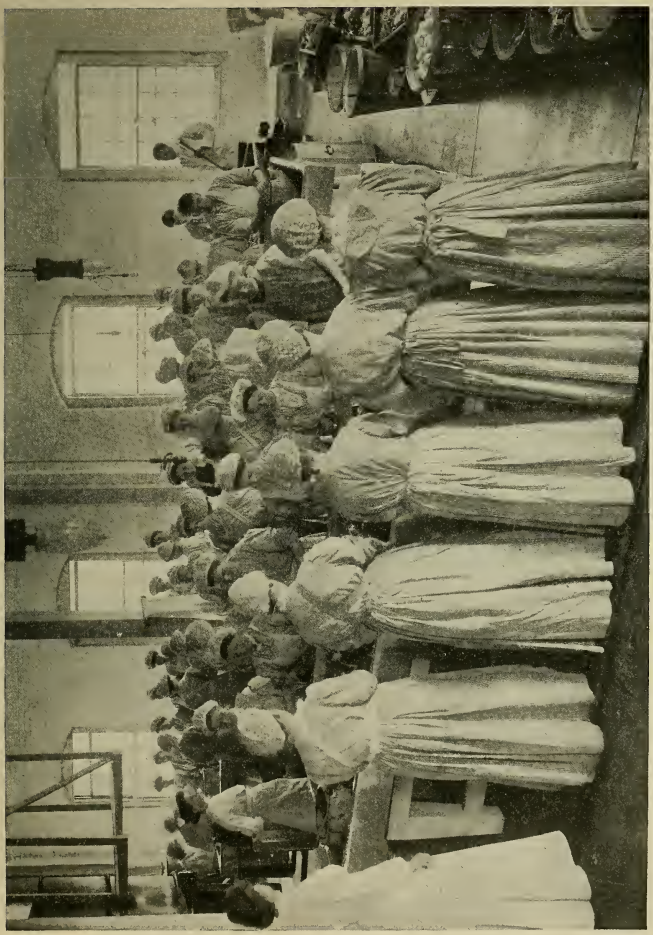
The table on page 68 shows the size and number of cans to the case of different products, the net weight of the contents of cans, the gross and legal weights of the case, the net weight of the contents of cans in the case, and the dimensions of the case. By "legal weight" is meant the weight of the cans and their contents.

FOOD INSPECTION

All canned foods, except those consumed within the State in which they are manufactured, come within the purview of the Federal food and drugs act, passed June 30, 1906. All canned meats come within the administration of the meat inspection act, passed upon the same date. All food products intended for export must be packed in conformity with the Federal requirements for purity, except that "food products intended for export may contain substances not permitted in foods intended for interstate commerce when the addition of such substances does not conflict with the laws of the countries to which the food products are to be exported and when such substances are added in accordance with the directions of the foreign purchasing agent." These two acts—the former administered by the Bureau of Chemistry of the Department of Agriculture and applying to all foods entering interstate and foreign commerce, the latter administered by the Bureau of Animal Industry of the same department and applied to the ante and post mortem inspection of all animals used in interstate and foreign commerce, to the sanitation of all packing plants, and to the manufacture of all meat products and products containing any considerable quantity of meat—have had a most wholesome effect in raising the quality of canned foods.

The provisions of the food and drugs act are particularly strong with reference to adulteration, misbranding, and the use of unfit material. The fact that the consumer can not examine or see the material until the package is opened for use has caused more attention to be given to this line than to those in which he can exercise ordinary discrimination. The terms adulteration and misbranding are made to have a more comprehensive meaning than is the general conception. Instead of adulteration being limited to debasement of a food by the addition of something injurious or the substitution of something cheaper, it is given a broader application by specification in a definition.

An article of food is deemed to be adulterated: "First, if any substance has been mixed and packed with it so as to reduce or lower or injuriously affect its quality or strength." For example, in canning, if more water be added than is necessary for the proper preparation of the product, as 5 ounces of water and 3 ounces of oysters in an 8-ounce can. "Second, if any substance has been substituted wholly or in part for the article." Such substitution may not necessarily lower the nutritive value. For example, the substitution of soya beans for the white or navy beans in canned pork and beans or baked beans. The white bean has been used so long and is so generally understood to be the basis for these products that substituting another becomes an adulteration. A mixture of other beans is permissible if clearly declared upon the label. "Third, if any valuable constituent of the article has been wholly or in part abstracted." For example, if part of the cream should be skimmed in making evapo-



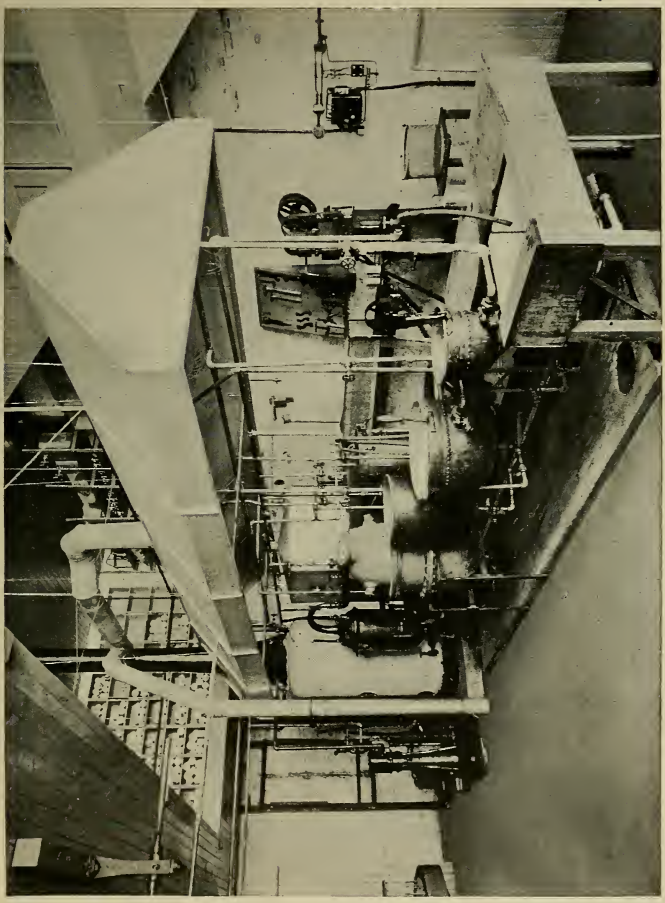
Women preparing vegetables. Uniforms for employees are required in many factories and manicurists in some

rated milk and the milk thus fall below the legal standard. "Fourth, if it be mixed, colored, powdered, coated, or stained in a manner whereby damage or inferiority is concealed." No coloring of any description is used in canned foods in this country; therefore this provision does not apply. The nearest approach is the use of starch in certain grades of canned corn, and this must be disclosed upon the label. "Fifth, if it contain any added poisonous or other added deleterious ingredient which may render such article injurious to health." This pertains especially to added bleaches, preservatives, etc., but also applies to any proscribed material, whether it be added directly or gain access through a factory operation or in any other manner without intent. No bleaches or preservatives are used in this country, and therefore the provisions have little application. A few products cause some attack upon the tin, but the improved methods in handling these foods has had the effect of keeping the amount below the legal limit. "Sixth, if it consists in whole or in part of a filthy, decomposed, or putrid animal or vegetable substance." This is the most important provision and is enforced by factory and product inspection.

A product is deemed to be misbranded: "First, if it be an imitation of or offered for sale under the distinctive name of another article. Second, if it be labeled or branded so as to deceive or mislead the purchaser. Third, if in package form, the quantity of the contents be not plainly and conspicuously marked on the outside of the package in terms of weight, measure, or numerical count. Fourth, if the packages containing it or its label shall bear any statement, design, or device regarding the substances contained therein, which statement, design, or device shall be false or misleading in any particular."

These provisions are simple and direct and apply to the purity of the product but not to the grade. No standards for the latter have been established. These provisions have been amplified by numerous "Food and drug decisions," which, while not having the effect of law, indicate the interpretation that the officials charged with the enforcement desire to have placed upon the decisions, and are accepted as guides by manufacturers. While there are no legal standards for canned foods, there are trade standards accepted by the manufacturer and dealer, which are indicated under the various articles.

The provisions of the Federal food and drugs act apply particularly to the finished product, but are sufficiently broad to cover the inspection of the manufacturing plants, so as to determine the character of the raw material used and the sanitation. The various States have their own sanitary laws, which, while not uniform, agree in essential points with the Federal law, and thereby supplement the latter in the control of the conditions and method of manufacture. The general requirements are that a canning factory be located away from insanitary surroundings; that the adjoining yards be kept clean; that the building be adequately



The Government experimental laboratory for the improvement of canned foods.

lighted and ventilated; that the floors be made tight and pitched so that they may be scrubbed at the close of each operating period; that water and steam be provided at points convenient for washing tables, machines, etc.; that the preparation tables and machinery be of such construction that they can be readily cleansed; and that proper facilities be provided for keeping the help clean. The whole trend of the State laws is to enforce cleanliness in the factories.

GENERAL GRADING OF PRODUCTS.

Nearly all fruits are packed in six grades: First, special extra; second, extra; third, extra standard; fourth, standard; fifth, seconds; and sixth, water or pie.

The special extra consists of the choicest specimens of prime, ripe, large fruit, even in color and texture, and perfectly peeled, pitted, or prepared. The sirup used is very heavy (usually 50 per cent), so that the finished product approximates a light preserve. Only a very limited quantity is packed and the majority of manufacturers do not offer the grade.

The extra comprises the very large, prime, ripe fruit, evenly colored, of fine texture, free from blemish, and packed in a heavy sirup, usually about 40 per cent. The cleaning, peeling, pitting, or other handwork must be of the highest character.

The extra standard consists of prime, ripe fruit of a slightly smaller size than the extra, and, as a rule, packed in sirup of about 30 per cent. The quality of the fruit and its preparation must be nearly equal to that of the extra. This is a very desirable grade, as the fruit is of prime quality and the sirup is more nearly of the consistency to bring out the best flavor.

The standard consists of fruit of smaller size than the extra standard, or of orchard run after culls have been removed, is not so uniform in ripeness, or even in color, may have some small blemishes, and is packed in a still lighter sirup, usually about 20 per cent. Or the standard may be orchard run from which the inferior fruit has been culled. It is packed in about 20 per cent sirup.

The seconds consist of small fruit, hard fruit, that which may be more or less off color, and pieces more or less irregular in shape from trimming. It is packed in weak sirup, usually about 10 per cent.

The water or pie grade is of the same character as seconds, but in addition there may be soft or overripe fruit. This is packed in water.

The sirup added to the fruit is generally expressed in degrees on the Balling or Brix scale which correspond with the percentage of sugar present. A 40° sirup corresponds to 40 pounds of sugar and 60 pounds of water in 100 pounds of sirup. The degree of sirup used in the grades depends upon the acidity or the amount needed to bring

out a particular flavor. The sirup will not test the same on the finished product, as juice is abstracted from the fruit and some of the sugar enters the fruit. The relation of the sirup on the "cut out" to that used in packing is shown in Bulletin 196, United States Bureau of Chemistry.

There are not as many grades of vegetables as of fruits, the grades generally being fancy, standard, and substandard, based upon the quality, but they may receive other designations based upon the size of the material, as the number of stalks in a can of asparagus or the size of peas, beans, etc. Not so much attention is paid to the composition of the liquor for vegetables as to the sirup for fruits, only sufficient salt or salt and sugar being added to bring out the flavor.

The general characteristics of the fancy grade are that only prime material be used, that it be uniform in quality, very tender, and of good flavor and color. Asparagus, beans, peas, etc., must have a clear or only slightly turbid liquor, and all products must show proper care in preparation.

The standard grade may be the field run of good stock, show less uniformity in selection, the liquor be somewhat turbid, or there may be some slight discoloration or breaking, due to processing.

The seconds, or substandard grade, is composed of wholesome, nutritive material that falls below the requirements of the foregoing grades.

Milk is not graded, but all of it must comply with the standard—minimum content of butter fat 7.8 per cent and total solids 25.5 per cent—fixed by the Government.

Meats are not graded. The provisions respecting meat products are much more rigid than for other products. There must be ante and post mortem inspection, and all subsequent operations in the way of curing and preparing the meats must be done under inspection. The sanitary conditions imposed are of the highest character and prescribed in great detail. The Government does not fix a minimum standard of meat which can be used without inspection, but requires inspection in all foods when there is any considerable percentage of meat used. It is not required in the case of pork and beans, pork and peas, or mincemeat, but is in soups, stews, rations, tamales, etc.

There is very little grading in marine products. In salmon the grading is done upon the species of fish used rather than upon any particular part of the fish. In tuna the white meat is separated from the dark, and the two are sold for what they are rather than as a first or second grade. Sardines are graded to some extent by the size or the number that go into a can. Oysters are also graded by the count on a very limited pack.

DESCRIPTION OF PRODUCTS.

FRUITS.

Apples (*Pyrus malus*).

Only the better cooking varieties of apples are used for canning. They are peeled and cored, and are prepared whole or in halves for dumplings and in large and thin slices for general cooking. The grades are fancy, standard, and pie. The fancy grade consists of all bright fruit, free from bruises and defects, carefully trimmed, and packed in sirup. The sirup is made dependent upon the acidity of the fruit. The standard grade is good field run, with the usual machine preparation, but with most of the bruised and defective fruit cast out. The packing is in water. The pie grade consists of smaller fruit, some of which may be dry, hard, or tough, may contain more bruise marks, and show less care in preparation.

Apple sauce is packed and consists of apples which have been thoroughly cooked and run through a coarse sieve. Apple butter is made from apple pulp, cider, and seasoning, cooked to a proper consistency. Apple jelly is made from certain varieties of apples that are especially rich in pectin and also from juice obtained by steaming skins, cores, and chops.

Apples and apple sauce are packed in No. 2½, No. 3, and No. 10 cans.

Apricots (*Prunus armeniaca*).

The apricot is a particularly fine canning fruit. It has a very pleasant, distinctive flavor, which not only persists, but under some conditions may improve with age. Apricots are halved and pitted, only a small quantity of fancy fruit being peeled.

The extra grade consists of prime ripe fruit more than sixty-eight thirty-seconds of an inch (54 mm.) in diameter, even in color, of fine texture and flavor, and packed in a 40° sirup.

The extra standard grade must possess the same characteristics but pass over a screen of sixty-four thirty-seconds of an inch (51 mm.) and be packed in a 30° sirup.

The standard grade consists of well-ripened fruit of good color, texture, and flavor, must pass over a screen of fifty-six thirty-seconds of an inch (44.5 mm.), and be packed in 20° sirup. More latitude is allowed in color and texture and in uniformity of pieces, and small spots of dark color on the skin are not barred. This grade is also packed as orchard run after culls have been eliminated. In an occasional year when fruit does not attain normal size, these grades are made one screen lower.

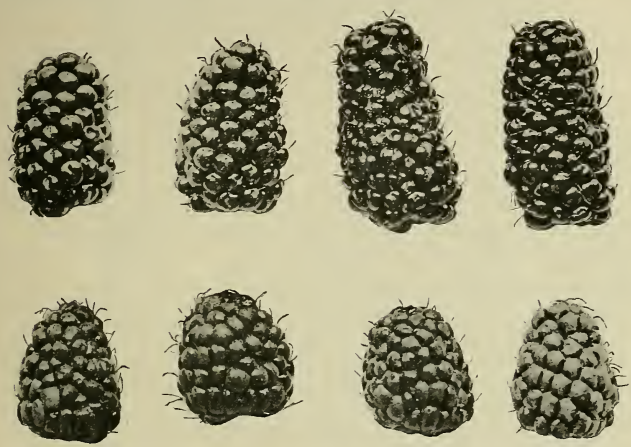
The second grade consists of small fruit above forty-eight thirty-seconds of an inch in diameter (38.5 mm.), may be more or less irregular in shape, not evenly ripened, and may have dark spots on the skin. A 10° sirup is used. The water grade consists of small fruit, irregular, spotted, and green stock culled from the previous grades and packed without sirup. The pie grade consists of soft and overripe fruit that is sound, but not suitable for the other grades, and packed in water.

Apricots are also kettle cooked to make a heavy pulp or butter. The stock for the body is soft and overripe fruit to which, when the cooking is nearly finished, some firm fruit is generally added for the sake of the appearance. Sugar is generally added. Sliced apricots are packed from the same grade as the extras and receive the same kind of sirup.

The cans used are No. 1, No. 1 flat, No. 2, No. 2½, and No. 10.

Berries.

Blackberries (*Rubus villosus*), loganberries (the supposed cross between a blackberry and raspberry), and raspberries (*Rubus occidentalis* and *Rubus idæus*) have similar methods of growth and of grading and packing, and may, therefore, be considered together.



Blackberries and loganberries on top line; raspberries on the second line. Natural size.

The cultivated blackberry attains a large size as compared with the wild berry, and the percentage of seed is much reduced. The flavor is particularly pleasing when brought out by a fairly heavy sirup. The raspberry is a much more delicate berry, from one-third to one-half the size of the blackberry. The color may be black, yellow, or red, the latter being preferred for canning. The flavor is distinct. The loganberry is of the same shape and size as the blackberry, is of a slightly deeper red color than the red raspberry, and has the flavor of both.

Berries are cleaned, graded for firmness and size, and have different degrees of sirup used. The extra and extra standard are selected berries of large size, are fairly firm, and are packed with 40° and 30° sirup, respectively. The standard grade consists of fruit which may be a little smaller, more irregular in size, and a little softer than the extra standard. A 20° sirup is used. The seconds are sound fruit, which may be soft,

and packed in 10° sirup. The water grade consists of ungraded and soft fruit packed in water.

The cans used are No. 2, No. 2½, No. 3, and No. 10.

Blueberries (*Vaccinium corymbosum, V. pennsylvanicum*).

The blueberry is one of the few wild fruits canned; only a very few are cultivated. They are used almost exclusively for pies, but if packed in a 30° sirup they have a very fine flavor. They are cleaned by blowing out the leaves and stems by machines and by hand picking. Most of them are packed in water in No. 2 and No. 10 cans.

White cherries.

Cherries (*Prunus cerasus*).

There are two types of cherries used in canning, the large sweet cherries of the Pacific coast and the sour cherry of Michigan and New York. The former are nearly all packed unpitted, while the reverse is true of the latter. The pits impart a peculiar flavor to the sweet cherry that is considered desirable.

The unpitted cherries are graded for size. The special extra grade consists of prime, ripe, selected fruit about 1 inch (25.4 mm.) in diameter, and free from all spots, cracks, or other imperfections. They are packed in 40° sirup. The extra grade consists of fruit of the same quality, but which will pass over a twenty-eight thirty-seconds of an inch (22.5 mm.) screen,

and is packed in 30° sirup. The extra standard consists of fruit the next smaller size, which will pass over a twenty-six thirty-seconds of an inch (20.5 mm.) screen, and is packed in 20° sirup.

The standard consists of fruit which will pass over a twenty-four thirty-seconds of an inch (19 mm.) screen, packed in a 15° sirup. The fruit need not be so uniform in color, nor so free from defects as in the preceding. The seconds are sound cherries, graded or ungraded for size, and may be more or less sunburned, have some cracks, and have more or less soft ripe and hard fruit. They are packed in 10° sirup. The water grade consists of ungraded, soft, immature, and sunburned fruit, packed in water. The sour cherries are pitted but not graded.

Packing is done in No. 1 flat, No. 2, No. 2½, and No. 10 cans.

Cranberries (*Vaccinium macrocarpon*).

This is the berry which furnishes the tart sauce for meat dressings in the fall and winter. It is a fruit which holds well both in the fresh state and in cold storage, so that it has not been canned until within the past few years.

The berries are cleaned and canned in water like the gooseberry. They are also kettle cooked, pressed through a sieve, and made into a thick pulp. Packing is done in No. 1 and No. 2 cans.

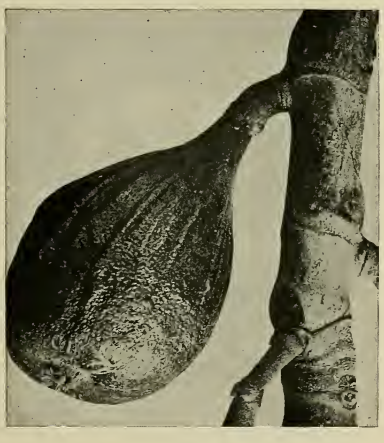


Fig.

Figs (*Ficus carica*).

The fig used for canning differs from that used for drying, being small, thin-skinned, and tender. Grades have not been very clearly defined. The figs are hand sorted for size, the rough portion of the skin removed, and then they are gently heated, with sugar, in jacketed kettles, so that the sirup becomes so heavy that they are nearly a preserve.

Figs are packed in 4-ounce, No. 1, No. 2, and No. 10 cans.

Gooseberries (*Rubus grossularia*).

The gooseberry is picked green, is ungraded, and is packed in water. It is used for pies and as a mixture in tasteless jam products to impart flavor. Packing is done in No. 3 and No. 10 cans.

Grapes (*Vitis vinifera*).

Two varieties of grapes are canned, the Muscat in the West and the Niagara in the East. The Muscat grapes are graded, but the eastern grapes are not.

The special extra consists of large, perfect fruit which will pass over a screen with openings twenty-six thirty-seconds of an inch (20.5 mm.) and is packed with 40° sirup. The extras pass over openings twenty-four thirty-seconds of an inch (19 mm.) and are packed in 30° sirup. The extra standard grade consists of fruit more than twenty-two thirty-seconds of an inch (17.5 mm.) in diameter, packed in 20° sirup. The standard grade contains fruit which is more than twenty thirty-seconds of an inch (16 mm.) in diameter, packed in 15° sirup. The fruit need not be so nearly perfect nor so free from blemishes as in the higher grades. The seconds and water grades consist of sound, ungraded, or small fruit, and fruit which may be spotted or unfit for the higher grades, the only difference between them being that the seconds are packed in 10° sirup.

Grapes.

Packing is done in No. 1 flat, No. 2, No. 2½, and No. 10 cans.

Grapefruit (*Citrus grandis*).

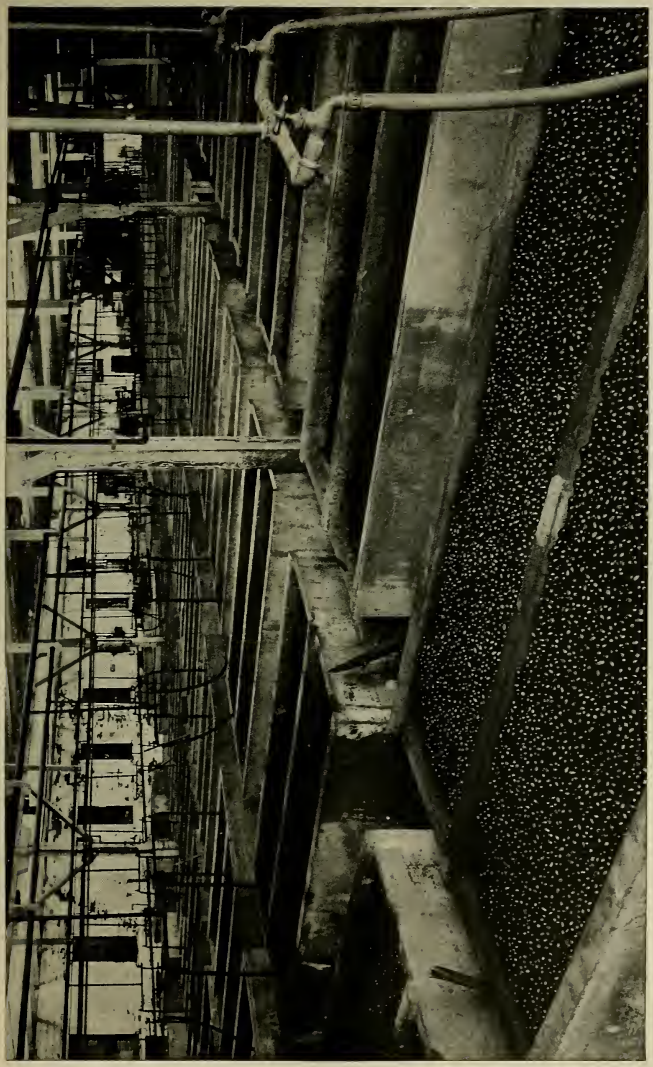
The cultivation of the grapefruit is limited to Florida, Arizona, and California. It has been very greatly improved under cultivation by the elimination of the excess bitterness which was formerly present in the lower layer of the skin and in the fibrous portion which separates the pulp chambers. It has come into great favor as a breakfast appetizer, being preferred by many to the orange. It is only recently, however, that the amount produced has equalled the demand, even during the height of the season, so that it is a new product in tin. The canning is done in Florida.

The fruit is peeled, the pulp cells separated, and the majority of the seeds removed. The packing is done in No. 2 flat and No. 2½ cans.

Olives (*Olea europæa*).

The canned ripe olive of California is rapidly displacing the pickled green olive. When the fruit is permitted to remain upon the tree until it is ripe and has developed the maximum oil, it develops a flavor far superior to the pickled green fruit. It then becomes a food as well as a condiment.

The olives are graded according to color, firmness, and size. Jumbo olives average about 55 olives to the pound, or 121 to the kilo; the mammoth, about 70 to the pound, or 154 to the kilo; large, about 88 to the pound, or 194 to the kilo; medium, about 107 to the pound, or 255 to the kilo; and standard, 120 to the pound, or 264 to the kilo.



Preparing ripe olives for canning. They are treated with weak lye for several days to remove the bitter principle.

The packing is done in No. 1, No. 2, No. 2 double height, No. 2½, and No. 10 cans.

Peaches (*Prunus persica*).

The peach leads all other fruits in canning, both in volume and value. It is a popular fruit, being pleasing to the eye as well as to the sense of taste, and it keeps well. There are two types, the clingstone and freestone, the former being preferred because of the finer though firmer texture and the evenness of color; the freestone, however, is often regarded as having somewhat the better flavor.

Peaches are split, pitted, and peeled, and very carefully graded for size, color, and texture. The special extra grade requires prime, ripened, perfect fruit that will pass through a seventy-six thirty-seconds of an inch (60.5 mm.) screen. Those that pass over are too large to permit seven pieces or more in a No. 2½ can. The workmanship in peeling and pitting must be perfect. A 55° sirup is used in packing. The extra peaches should have the same qualities as the special extra, but pass through a seventy-two thirty-seconds of an inch (58 mm.) opening, and be packed in a 40° sirup. The extra standard grade consists of prime, ripe peaches of the size that will pass through a sixty-eight thirty-seconds of an inch (54 mm.) screen, and is packed in 30° sirup. The standard grade consists of the orchard run of sound fruit, but need not be so uniform in size or color as the higher grades. The peeling and pitting should be well done, but some irregularities are tolerated. The sirup should be 20°. The seconds consist of peaches which may be hard, small, off color, or irregularly cut. A 10° sirup is used. The water grade usually consists of overripe or soft fruit, irregular pieces, and small and discolored stock from the higher grades, packed in water.

A pear, natural size, showing the size for 9 pieces to a No. 2½ can.

Sliced peaches were formerly prepared from excessively large fruit and from irregularly cut stock, but the demand has become so great that they are now prepared from the same class of stock as the special extra, extra, and extra standard, and are given a corresponding sirup. Peaches

are also packed whole and unpitted, and are known as Melba style. These are packed with one, two, three, or four in the can, depending upon its height. The sirup is usually 55°. Soft peaches are also cooked in jacketed kettles and run through a screen, making a heavy pulp or butter.

The packing is done in 4-ounce, No. 1 flat, No. 2 flat, No. 2½, No. 3, and No. 10 cans.

Pears (*Pyrus communis*).

Pears are graded, peeled, cored, and packed in halves. Owing to their shape and peculiar texture, all the work is done by hand. They must be well matured, but not soft enough to break in handling.

The special extra grade must be of such size that 8 to 9 pieces fill a No. 2½ can, be evenly matured, of fine texture, perfectly peeled and cored, and packed in 40° sirup. The extra grade should have the same qualities, but pack from 9 to 12 pieces to the can, and in 30° sirup. The extra standard should have the same qualities, but may pack from 10 to 14 pieces to the can, and in 20° sirup. The standard grade should have fruit of good quality, but need not be so uniform in size, color, or quality, and more tolerance is permitted in imperfect peeling and coring. The sirup used should be 15°. Seconds comprise soft pears, large and small ones, and irregular pieces, packed in 10° sirup. The water grade is of the same quality as seconds, but packed in water.

Pears are packed in No. 1 flat, No. 2 flat, No. 2, No. 2½, and No. 10 cans.

Pineapple.

Pineapples (*Ananas sativa*).

Pineapple packing has been almost wholly transferred to the Hawaiian Islands, as the fruit grown there is of high quality. Formerly the fruit was collected while underripe in Cuba and brought to the eastern canneries, but this required too much time and expense as well as a loss of quality.

The extra grade consists of selected, prime, ripened fruit, the eyes fully developed, the color light yellow, the tissue tender but firm enough to retain a clean-cut outline while handling and processing. The peel and hard core are removed. A 50° sirup is used. The second extra or extra standard must have all the characteristics of the extra, except that it may be of a lighter color or the fruit may be slightly greener. The sirup

is the same. The difference between these grades is so slight that the latter is being discontinued. The standard grade consists of fruit with some imperfections in the development of the eyes, some variation in color, and some tolerance is permitted in cutting. A 40° sirup is used. The fourth grade is also known as second standard, and includes some imperfect slices from the tops and butts, more light fruit, and more pieces with an eye broken out. The sirup is 40°. The fifth grade consists of irregular and spotted fruit and culls.

Pineapple is also packed in pieces, chunks, and shredded or grated. The disks made in coring are packed for confections.

Sliced pineapple is packed in No. 2, No. 2½, and No. 3, and grated pineapple in No. 2, No. 2½, and No. 10 cans.

Plums (*Prunus domestica*).

The plum has always been a popular fruit, but its place among the canned foods has been more nearly that of an appetizer. It is a fruit that is much esteemed, but the desire is satisfied with a lesser amount than of many other fruits. In the West the greengage and yellow egg varieties are most used, and in the East the damson. The former are carefully graded for size, the latter are not. The damson plum is mentioned in the first consignment of canned food exported from the United States.

The extra grade of plums is selected from ripe fruit, free from spots or blemishes, more than fifty-six thirty-seconds of an inch (44.5 mm.) in diameter, and is packed in 40° sirup. The extra standard is of the same quality, is more than forty-eight thirty-seconds of an inch (38.5 mm.) in diameter, and the sirup is 30°. The standard grade is from good stock, but may show more variation in ripeness and in color, may have some blemishes, and the fruit be more than forty thirty-seconds of an inch (31.5 mm.) in diameter. The sirup should be 20°. The seconds should pass over a 1-inch screen, may be irregular and spotted, and be packed in 10° sirup. The water grade generally consists of those which are irregular, smutted, and soft ripe, and may be of any size.

Plums are packed in No. 1 flat, No. 2½, and No. 10 cans.

Prunes.

The dried-prune crop on the Pacific coast amounts to about 250,000,000 pounds annually, a very large part of which is exported. The one objection to this method of preparation is that where the goods are shipped through or into the Tropics there may be some deterioration. To overcome this condition prunes are canned, either dry or in sirup. A distinct advantage in this method is that the fruit is ready to serve at any time and the delay and inconvenience of soaking and preparation is avoided.

The prunes used for canning are generally what are known as 50s to 60s dried, or which run that number to the pound. They are packed

in sirup or in water, the extra grade being packed in 30° sirup, the standard grade in 20° sirup, and the undesignated in water. They are packed in No. 2½ and No. 10 cans.

Strawberries (*Fragaria virginiana*).

The strawberry grows upon a ground vine, and the stem is taken in pulling the fruit. It is one of the most popular fruits when fresh, but there are only a few varieties that give satisfactory results when canned. The fruit must be of fair size, firm, with a strong color, and rather acid. The fruit is stemmed, graded for size, and washed, the grades corresponding to those of the blackberry. They are packed in No. 2 and No. 2½ cans.

Strawberry. Natural size.

Fruit Butters.

Fruit butters, compotes, jams, jellies, and preserves of almost all the varieties described are packed either alone or in such mixtures as the customer may desire. Those to which orange, lemon, and pineapple are added are most in demand. The packing is principally in No. 1 and in the special can, 4 inches in diameter and $3\frac{3}{16}$ inches high, holding 20 ounces. Some whole fruits are also packed in mixtures.

VEGETABLES.

Artichokes (*Cynara scolymus*).

The base of the flowering heads of the artichoke are esteemed as a delicacy, and recent attempts at canning have demonstrated that they can be preserved in this manner and made available at any place, where formerly they could be properly served only near the point where grown. The flowering heads are picked while the parts are tender, and they are rushed to the factory and packed before any toughening can occur. They retain their character and flavor, and are especially prized for salads or to be served with a dressing like mayonnaise.

Asparagus (*Asparagus officinalis*).

Asparagus stands at the head of the list of vegetable delicacies. It is the most expensive product grown either for the fresh market or to be canned, as it can be grown successfully only upon the richest, consequently the most valuable, land. It requires much labor for its cultivation and an exceptionally large amount for harvesting, as each stalk is cut separately and must be handled five or more times. It is growing in popularity with wonderful rapidity, as attested by the fact that in 1905 the total pack was about 5,500,000 tins, and in 1915 about 19,000,000 tins. It is exported to all countries having tariff regulations that are not prohibitive.

Asparagus is packed according to the size and color of the stalks. The white is preferred by the majority of persons, and consists of the stalks which are cut before they have come through the ground and have been exposed to the light. The cutters locate the stalks by the cracks which are formed as the top is about ready to break through. The green asparagus differs from the white in that it has been exposed to light for a day or less and during that time acquires a different flavor. The grading for size is based upon the number of stalks required to fill a No. 2½ square can, which averages 20 for mammoth, 30 for large, 40 for medium, and 50 for small. In asparagus tips about 30 per cent more stalks are required

Artichokes. The fleshy part of the bracts and other base of the flowering head are used.

for the same grades. It is packed in No. 2½ tall and No. 2 square cans, and in No. 1, No. 2, and No. 2½ round cans. The square can is preferred.

Refugee Beans (*Phaseolus nanus*).

Certain varieties of beans have been developed for their pods rather than for the seed and are eaten or canned while in a green state. The pods are fleshy, crisp, and tender, and when broken show either no string or only a very rudimentary one.

The beans are picked by hand at frequent intervals in order to secure the maximum number of small size. They are sorted by machine according to their diameter, and the larger ones cut to definite lengths. The beans must pass between rollers set at fixed distances, so as to make a separation for size, the first grade being eight sixty-fourths of an inch (3.2 mm.); the second, eleven sixty-fourths of an inch (4.4 mm.); the third, fourteen sixty-fourths of an inch (5.5 mm); the fourth, eighteen sixty-fourths of an inch (8.7 mm.); and the fifth grade pass over. The smaller the bean, the higher the grade, though the highest nutritive value is in the more mature of the series. Beans are filled into the can by weight. The packing is done in No. 2, No. 2½, No. 3, and No. 10 cans.

Wax beans are like the green beans, except that they have a very light yellow pod. They are handled in the same manner.

Asparagus. Small tip, small, medium, large, and mammoth stalks, natural size

Lima Beans (*Phaseolus lunatus*).

Lima beans are shelled and packed both green and ripe. They have a distinctive flavor that has long been esteemed. The beans are graded for size by the use of sieves of 24, 30, 31, and 32 thirty-seconds of an

inch mesh (19, 23.5, 24.5, and 25.5 mm.). Those passing through the first sieve are called tiny; through the second, fancy; through the third, medium; through the fourth, standard; and those passing over, mammoth.

Packing is done in No. 1, No. 2, and No. 3 cans.

Kidney Beans (*Phaseolus vulgaris*).

The red kidney bean is from dry stock, ungraded, and is packed either plain or with chili sauce. Packing is done in No. 1 and No. 2 cans.

String beans, natural size, after canning.

Beets (*Beta vulgaris*).

Beets for canning are from an especially red, garden variety. They are planted so as to develop late in the fall when the weather is cool, in order to secure small size and the maximum of tenderness. Beets which are not red throughout or have large vascular zones are not suitable. They are graded according to size, the small being less

than 1 inch (25.4 mm.) in diameter, the medium from 1 to 1½ inches (25.4 to 38 mm.), the large from 1½ to 2 inches (38 to 50.8 mm.), while those above 2 inches (50.8 mm.) are used for sliced beets. They are packed only in lacquer-lined tins in order to retain their color.

Packing is done in No. 2, No. 2½, and No. 3 cans.

Lima beans, natural size. Tiny, fancy, medium, large, and mammoth.

Brussels Sprouts (var. of *Brassica oleracea*).

Brussels sprouts are a variety of cabbage which has been developed to produce a number of heads along the stalk. These small heads are compact, the leaves being much finer in texture than the regular cabbage. They are collected when about 1½ inches in diameter. The outer leaves are removed and the packing is done in weak brine. Owing to the fact that the work is done very promptly after harvesting, the canned product is generally superior to the fresh found on the market.

The packing is in No. 2½ cans.

Cabbage (*Brassica oleracea*).

Small firm heads of cabbage are selected, the outer leaves removed, and the core and coarse midribs cut out. The packing is done in No. 3 cans.

Carrots (*Daucus carota*).

Carrots are packed whole, sliced, and diced. They are used largely by hotels and restaurants in soup stock. The packing is almost wholly in No. 10 cans.

A beet of the most desirable size used in canning. The flavor is well developed but there is no toughening of the fiber.

Cauliflower (*Brassica oleracea* var. *botrytis*).

Only the firm heads of cauliflower are used. They are trimmed carefully and then broken apart. While the quality is not injured by canning, the bright color so desirable in the fresh head is not retained. It is packed in No. 3 cans.

Celery (*Apium graveolens*).

Celery is canned in stalks the full length of the can, or cut to short lengths. It is used largely as an addition to soups. Packing is done in No. 2 and No. 10 cans.

Corn (*Zea mays*).

Corn is one of the three largest canned staples. Sweet or sugar corn has been cultivated for a very long time especially to be eaten in the fresh state. The varieties preferred develop kernels with small or medium size grains which are tender and have a high sugar content. More effort has been expended in trying to pack this article than probably any other. More special machinery has been developed for handling it—huskers, silkers, cutters, mixers, cookers, and fillers—than for any other, so that it is handled in very large quantities at a minimum expense for labor.

When packed with a heavy body, it is called cream corn; when the grains are cut as near to the cob as possible and they remain separate in the brine, it is called whole-grain corn when the grains are slit on the end and the contents squeezed out, it is called hulled corn; and when the cut grains are run through a cyclone to remove all hull and tough material, it is known as green corn meal or kornlet. A small amount of corn is packed on the cob, but not enough to be a factor in the trade.

Okra.

The grades of corn are fancy, standard, and seconds. A can of fancy corn should be filled to within three-eighths of an inch (9.3 mm.) of the cover, be young, tender, with the distinctive flavor of young corn, medium moist, practically free from husk or silk, and only slightly darker than the natural product. A can of standard corn should be well filled, reasonably tender, of a fairly bright color or only slightly brown, nearly free from silk, bits of husk or cob, and have the flavor of green corn. The second grade is green corn, but too mature to qualify under the above grades. The grains are harder and have more starch and the hull is tougher. There may be some separation of brine and a darker color from processing.

Succotash is a mixture of corn and beans, the latter preferably green lima beans. The beans must be present to the amount of not less than 20 per cent. If the ripe lima bean be used, that fact must be declared upon the label. The grades of succotash correspond to those of corn. The packing of corn and succotash is almost exclusively in No. 2 cans.

Delivering corn at a factory. A large plant will pack 250,000 cans per day.

A typical corn and vegetable packing plant, light and sanitary.

Okra (*Hibiscus esculentus*).

Okra is a semihardy plant grown for its pods, which are used extensively in the making of gumbos, and are rapidly coming to be used in vegetable soups. It is one of the products for which a taste must be acquired, after which it is relished. The pods are packed preferably when less than 3 inches long. They are canned whole or sliced. Packing is done in No. 2 and No. 3 cans.

Peas (*Pisum sativum*).

The pea is another one of the three vegetables most largely canned. It was one of the first products to be canned, and for a long time was regarded as a dainty or luxury. On only one other line, corn, has there been a corresponding amount expended in the development of special machinery. The harvester, viner, cleaner, washer, sizer, gravity grader,

A pea viner. The mowed vines are fed into the machine, the pods are broken open, and the tender peas separated without injury.

split remover, blancher, and filler represent persistent effort in a mechanical way to make every step from the cutting to the completed can automatic, continuous, and without the use of the human hand on any part of the product which is to be consumed. A single viner shells more peas in a day than was formerly accomplished by 200 women. "An hour from the field to the can" is not literally true, but is very closely approximated. The speed and economy with which this crop can be handled has made possible the enormous consumption of a choice food that was once available only to the rich.

Two varieties of peas are used, the smooth, round pea, known as the early or Alaska type, and one not quite spherical, wrinkled when mature,

known as the sweet wrinkled. The two have distinct flavors, the latter being generally sold as sweet or sugar peas.

Peas are graded according to size. No. 1 is the smallest and passes through a screen of eighteen sixty-fourths of an inch (7 mm.); No. 2, twenty sixty-fourths (8 mm.); No. 3, twenty-two sixty-fourths (8.7 mm.); No. 4, twenty-six sixty-fourths (10.3 mm.); and No. 5 passes over this screen. With the sweet wrinkled varieties, it is sometimes desirable to add one more division, a screen of twenty-eight sixty-fourths of an inch (11.1 mm.). These correspond to the old designations—petit pois, extra fins, fins, early June, marrowfat, and telephone. The smallest peas are the ones most prized and bring the most money, but the larger sizes have better developed flavor and higher nutritive value.

The grades are fancy, standard, and substandard. Fancy peas are those packed from young succulent stock, of fairly uniform size and color, unless declared ungraded for size, and in reasonably clear liquor. Standard peas are packed from stock less succulent than the fancy grade, but green and of mellow consistency, of uniform size and color,

Peas, natural size. No. 1, or petit pois; No. 2, or extra sifted; No. 3, or sifted; No. 4, or early June; No. 5, or marrow fat; and No. 6, or telephone.

unless declared to be ungraded for size, and in reasonably clear liquor, though not necessarily free from sediment. Substandard peas are packed from stock that is over-developed, though not fully ripened, or that lack in other respects the qualifications for the standard grade.

Peas are packed in 6-ounce, No. 1, and No. 2 cans.

Peppers, Chilies (*Capsicum annuum*).

The growing and packing of chilies is confined to a small territory in southern California, though attempts at cultivation are being made in some of the Southern States. The chili used for canning is the large, sweet variety. It is picked green, peeled, a part of the seeds removed, and packed as nearly whole as possible. The pods are layered in the small cans. It is also packed ground, to be used as an addition to soups and for flavoring other foods. It is not graded.

The packing of whole chilies is done in a special can 3 inches in diameter and 2½ inches tall. The ground chili is packed in No. 10 cans.

Pimienta.

This is a sweet pepper and would be more appropriately so designated rather than by the foreign name. Like the chili, it is packed almost exclusively in southern California. The peppers are large, pear-shaped, and have thick, fleshy walls. They are not picked until fully ripened, when they are of a very bright color. They have slight pungency and are more highly esteemed than the foreign ones. They are peeled, the

seeds removed, and the pod carefully folded, so that it may be kept for garnishes, etc. They are not graded. Packing is done in a pimienta can.

Pumpkin (*Cucurbita pepo*).

Pumpkin is packed in the form of a heavy, but thoroughly screened, pulp. Most pumpkin is packed plain, but some is packed spiced and ready for use. The cans used are No. 2½, No. 3, and No. 10.

Rhubarb (*Rheum rhaponticum*).

Rhubarb has long been used as an appetizing tart sauce or in pies. It is canned in sirup or in water. The leaf stalks are cut transversely into lengths of about one-half inch (13 mm.). Packing is done in No. 3 and No. 10 cans.

Spinach. One-third natural size.

Spinach (*Spinacia oleracea*).

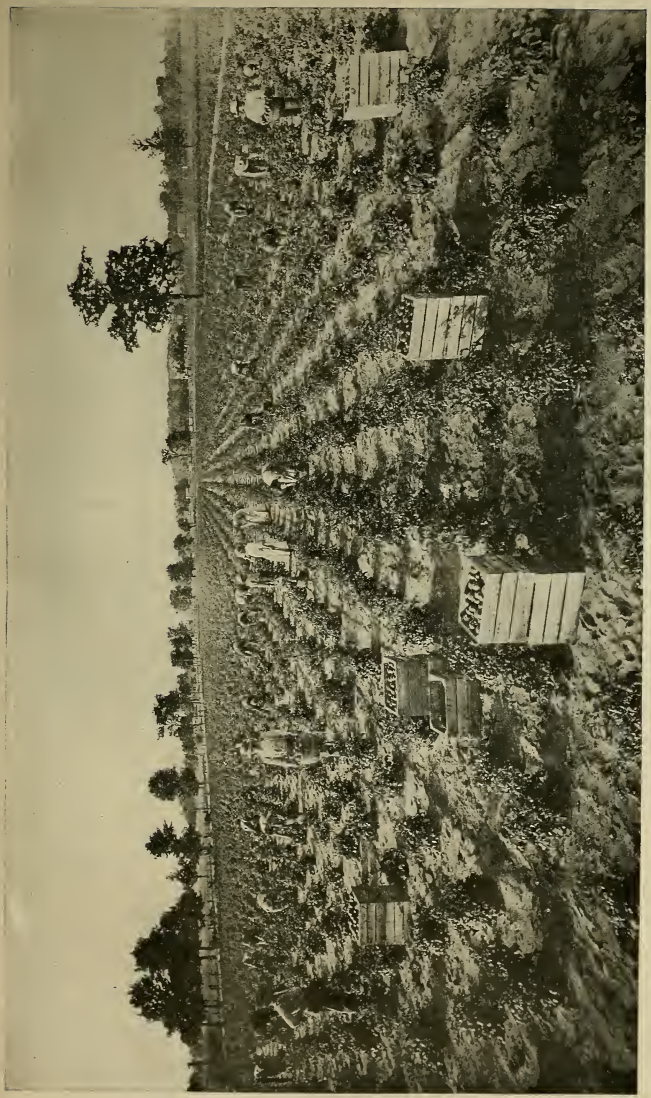
Spinach belongs to that class of foods generally denominated "greens." It is grown both as an early spring and a fall crop in order to secure the tenderness and improved flavor that results from growth in cool weather. The rapid increase in the consumption of spinach is an indication of the extension of canning to the cheaper foods as a matter of economy. Canned spinach is preferred even during the season when it may be obtained fresh, because when prepared it is free from all waste and is thus more economical. Packing is done in No. 2½ and No. 3 cans.

Squash (*Cucurbita ovifera*).

Squash is prepared in a manner similar to pumpkin, with which it is closely related. It is packed in No. 2½, No. 3, and No. 10 cans.

Sweet Potatoes (*Ipomoea batatas*).

The sweet potato does not keep well after harvesting, and aside from this there is considerable loss from shrinkage. In order to avoid the losses from holding, the potatoes are peeled and canned. There are two styles of packing—whole and those mashed or stuffed into the can.



Harvesting tomatoes. Some of the larger firms use the product from several thousand acres.

There are two grades, fancy and standard. The fancy grade consists of selected whole potatoes or large pieces, carefully trimmed and packed by hand as closely together as possible. They should be nearly dry, of bright color, and of even texture. The standard grade consists of whole potatoes mashed into the can to a given weight. No attempt is made to preserve their identity. They should be fairly dry and of good color, though some brown is admissable.

Packing is done in No. 2½ and No. 3 cans.

Tomato (*Lycopersicum esculentum*).

The tomato is the most widely canned of all the vegetables. It is packed whole, and as pulp, purée, and a mixture of whole tomatoes and purée. Tomatoes are also packed with corn, beans, okra, and whole or ground peppers; they form the principal part in tomato soup and are a part of nearly all vegetable soups. They constitute the principal dressing for beans, and in the form of the great American condiment, ketchup, form a relish for meats and other foods. They are packed in every size of container from the individual service to the 5-gallon can.

Four grades are recognized in the trade—extra, extra standard, standard, and seconds or soup stock. Extra tomatoes should be selected, prime, ripe fruit with a firm fleshy body, well-developed flavor, and a uniform red color. A can when opened should be full and most of the tomatoes whole or in large pieces, free from peel, cores, or defects. Extra standard tomatoes should be selected, prime, ripe fruit, have a fairly fleshy body, good flavor, but there may be some variation in color. The can when opened should show the majority of the tomatoes whole or in large pieces. Standard tomatoes should be field run, of sound, ripe fruit, fair body, and of good flavor, but the color may be irregular and the tomatoes broken. They should be well peeled and cored. Seconds, or soup stock, consists of small tomatoes, pieces, and parts with more or less green and soft stock.

Tomato purée is the best form in which to obtain the tomato. It is the whole tomato with skin and seeds removed and concentrated to a little less than one-half its bulk. It is in the proper condition for the addition of seasoning and ingredients to make soup or sauces. There is also economy in the size of the can used and in the freight transportation.

Tomato paste is the heavily concentrated tomato. It is produced by evaporating pulp to a very heavy consistency in a vacuum kettle or by first making pulp and then draining it. In the latter method of preparation there is loss of acidity and soluble solids and with little more remaining than the fiber and coloring matter. The former method is the one to be preferred. The paste varies in composition, but this is regulated in the trade by specifying the specific gravity desired. The packing is done in 5½, 6½, and 12 ounce cans.

Cans used for whole tomatoes are No. 1 flat, No. 2, No. 2½, No. 3, and No. 10; for purée, the sauce can, No. 1, No. 2, and No. 10.

Turnips (*Brassica rapa*).

Canned turnips are used mainly in hotel and restaurant service. They are grown, like beets, late in the fall to produce a very small, sweet, tender root. Packing is done in No. 2½ and No. 10 cans.

MARINE PRODUCTS.

The canning industry may be said to have had its commercial beginning, both in Europe and America, with the packing of marine products. These products form one of the very important lines in the industry, the value of the salmon, sardines, oysters, and tuna being about $40,000,000 annually. The packing of shrimp, crabs, clams, roe, and other fish products, while of minor importance, in the aggregate reaches a very considerable sum. The packing of fresh-water fish, however, has never attained any commercial importance. Fish have long been recognized as one of the sources of the cheapest food, and with the modern development of methods of catching and machinery for handling, preservation by canning affords a source of cheap protein. The cost is much less than with meat from the domestic animals. Tuna, shrimp, crabs, and oysters afford a particularly inviting and wide range of appetizing products.

Razor clams.

Abalones (*Haliotis tuberculate*).

The abalone is obtained in limited quantities off the coast off southwestern California and Lower California. It is taken by deep-sea divers, each shell being removed from its attachment by means of a pry bar. It is the largest shellfish canned and is minced. The packing is in ½-pound and 1-pound flat cans.

Clams (*Mya arenaria*).

Clams are packed upon both the Atlantic and Pacific coasts, the former consisting almost exclusively of the little-neck variety and the latter of the razor clam. They are quite different in character. The former is canned whole, in chowder, and as broth, whereas the razor clam is much larger and requires so much trimming that it is minced and sold as minced clam. Packing is done in No. 1 tall, No. 2, and No. 3 cans.

Crabs (*Callinectes hasta*).

The crab, like the lobster, has become so generally esteemed as a delicacy and the demand for fresh stock is so great that only a very limited quantity is canned. The entire output at the present time is

limited to a few factories around Norfolk, Va. The crab meat is obtained by first boiling the crabs, then cracking or cutting the shells and extracting the meat by picking, by centrifugal force, or by compressed air. It is packed in two grades, the large clear white meat and the mixture of small bits and of dark meat. Some of the shells are cut, washed, cleaned, and packed in separate packages to be used in serving dishes, as deviled crab.

Cod or Fish Flakes.

From the time of the settlement of New England, cod and other ground fish have been caught and dry cured, and the operation has been conducted upon such a large scale as to make it one of the important food industries. To take the place of the dried fish, fish flakes have been developed and are rapidly becoming popular. The main part of the flakes is composed of cod, but some cusk and haddock are generally added.

A clump of oysters.

The fish are mild-cured and, when ready to use, are soaked in water to remove any excess salt. Unlike the treatment of salmon, the fish are cooked and the skin and bones removed before being placed in the can. The fish are broken apart by the cooking, and this has given rise to the trade name "fish flakes." There is no grading.

The packing is done in cans of special size, the small being $2\frac{3}{16}$ inches (69.5 mm.) in diameter and $3\frac{1}{8}$ inches (80 mm.) tall, the large size $3\frac{3}{8}$ inches (86 mm.) in diameter and $3\frac{1}{8}$ inches tall.

Oysters (*Ostrea virginiana*).

While the oyster is found along the greater part of the Atlantic and Gulf coasts, the canning is limited to the region of Chesapeake Bay and Savannah, Ga., in the East, to Apalachicola and the coast of Mississippi and Louisiana on the Gulf. The supplies obtained at other points are used in the fresh trade. The supply of this shellfish has been so much depleted that the gathering is limited to certain sizes and to certain months in the year. Every effort is being made to replenish the supply by cultivation.

The oysters are taken by boats with dredges, are steamed to open the shells, and then shucked, washed, and filled into cans. The work is nearly all done by hand.

The grading is done upon the basis of the size as determined by the number of shells in a barrel. Very large oysters, running from 450 to 600 per barrel, are known as extra select, from 600 to 800 as select, and from 800 to 1,000 as standard. The cans used hold 3, 4, 5, 6, 8, and 10 ounces.

Sardines (*Clupea harengus*).

Sardine canning began in the United States, at Eastport, Me., in 1841, and that port continues to be the center of the industry. Sardines are also packed on the Pacific coast at Monterey, Cal. The food officials have defined the American sardine to be any small herring, and this is what is understood generally in the trade. The Pacific coast sardine differs slightly from the Atlantic and is a much larger fish, at one time being described as a small mackerel.

Taking salmon from a trap.

The sardine industry is quite similar to what it was a half century ago. The fish are caught in brush weirs and impounded until they have freed themselves of feed; they are then taken to the factory and given a short pickle, after which they are washed, then fried in oil or dried in a steam or hot oven, and packed in small, flat cans with oil, or a mustard or tomato sauce. Sardines are nearly all packed in what are known as quarter or three-quarter cans, the former holding 4 and the latter 12 ounces.

Very little attention is given to the grading of sardines, as probably 90 per cent are ocean run, steamed, and known as standard. The extra standard and fancy grades are usually packed to order. The fancy grade consists of sardines of nearly uniform size, medium fat, fried in oil, and packed in olive or cottonseed oil. The fish must be carefully layered to show the bright bellies and be free from broken or skinned fish. The

extra standard grade consists of steamed fish, selected for uniformity of size or count to the can, and packed in oil of a specified quality. They must present an appearance similar to the fancy. The standard grade consists of ocean run, steamed fish, packed in cottonseed oil.

Sardines in mustard or in tomato sauce are of the same grade as the standard, but in addition may contain the fish which are more or less broken in handling or which show skin blemishes.

The Pacific coast sardines are fried in oil and the majority packed with tomato sauce. They are packed exclusively in oval cans holding 1 pound. The number varies from five to eight.

Grayfish (*Sequalus acanthiar*).

The value of this fish for food has only recently been recognized. It is capable of being used in a variety of ways and is an excellent food. It is canned in much the same manner as salmon, though a somewhat different method of preliminary treatment is required. It is packed on both the Atlantic and Pacific coasts and in 1-pound salmon cans.

Grayfish.

Herring.

In taking the sardine it frequently happens that there is a considerable percentage of rather large fish, too large to pack properly in the regular sardine cans. These fish have the tails clipped and are packed in round cans, which are well filled, but no attempt is made at careful layering. They may be packed plain or with tomato sauce, and make a very wholesome cheap product, but lack the attractive appearance of the smaller fish. They are packed in 1-pound and No. 2 cans.

Herring Roe.

Herring roe is obtained as a by-product in the herring fisheries on the coast of Maryland, Virginia, and North Carolina. It is usually minced. The packing is in 1-pound and No. 2 cans.

Salmon (*Oncorhynchus*).

The salmon stands preeminent as the fish for canning. It is caught in great quantities in the rivers emptying into the Pacific Ocean from San Francisco to near the straits in Alaska, with the principal centers of the industry on the Columbia River and Puget Sound. The first packing of Pacific coast salmon occurred in 1864, the total pack being less than 100,000 tins. In 1882 the industry was extended to Alaska, and now

the total pack is not far from 375,000,000 tins. The catching of salmon is done on such a gigantic scale that realization of its extent can be obtained only by a visit to the fishing grounds during the season. The fish are caught in enormous traps capable of impounding 100,000 pounds at a time, in nets that are operated by power or by teams, and with tackle small enough to be handled by one man.

There are several varieties of the fish, varying in size and in the color and texture of the flesh and in flavor. The Sockeye is the variety which runs in the very large schools every four years.

Salmon canning is almost wholly a mechanical process. The boats are loaded and unloaded by power; the fish are washed and scrubbed by machines; the "iron chink" cuts off the fins, opens the fish, extracts the viscera, and scrubs the fish inside, after which they are rewashed, cut into proper lengths, filled into cans, and automatically weighed without being touched by hands. The development of special machinery has gone as far or further in the canning of salmon than with any other

King salmon.

article of food, and what formerly required hundreds of persons in the butchering and in the filling and closing of cans is now done by a very small number.

Salmon is graded only in a general way, based very largely upon the color and texture of the flesh rather than upon any particular cuts.

The Chinook, King, or Spring salmon is the largest fish, weighing on an average about 22 pounds. The flesh is of medium texture, with sufficient oil and a very fine flavor, the color varying from a pale to a very deep pink. The Red, Blueback, or Sockeye is a small fish, weighing about 8 pounds, and has very red flesh of good texture. The Coho, Medium Red, or Silverside, is a smaller fish, weighing about 6 pounds, with flesh decidedly pale in color but quite firm. It has usually a sufficient amount of oil, and is of good flavor. Its deficiency is more a matter of appearance than of real quality. The Humpback is the smallest salmon, weighing only about 4 pounds, Its flesh is pale and somewhat soft. The Chum or Keta averages about 8 pounds in weight, with flesh that is yellowish and rather soft.

Salmon is packed in 1-pound tall, 1-pound flat, and ½-pound flat cans.

Sea Mussels (*Mytilus edulis*).

The sea mussel occurs in great abundance along the northern shores of the Atlantic and Pacific coasts. It is not as attractive in appearance as the oyster or clam, having more dark flesh and more yellow color. The flavor is more pronounced, requiring less for chowder or when added to dressings. It is somewhat tougher than the oyster and clam, so is less desirable when fresh. This objection is overcome when it is canned. Sea mussels are packed in No. 2 cans.

Shad Roe (*Alosa sapidissima*).

The shad is sold as a fresh or frozen fish, but in the dressing the roe is saved and canned. The principal points of packing are the Sacramento River and Chesapeake Bay. The western packing is done in 8 and 12 ounce oval tins, the roe being held as nearly whole as possible.

Shrimp. One-half natural size.

The eastern packing is done in 1-pound and No. 2 round cans, the roe being cut or minced.

Shrimp (*Panæus brasiliensis*).

Shrimp are crustaceans belonging to the same group as the crabs and lobster, but are much smaller. They are found in the Gulf of Mexico and are caught on the east coast as far north as Savannah. Until within the last 10 years they were caught only in the shallow water along the shores, and only under favorable weather conditions in the late fall and early spring. This made a very uncertain catch. The fishing tackle has been very greatly improved, and the work is now conducted in fairly deep water, from boats, and the catch is very much stabilized.

The shrimp are iced and the heads and shell removed, so that the part eaten is the large muscular portion of the tail. They are cooked in brine and change from a semitranslucent gray color to a clean white overlaid with pink. The shrimp is a delicate morsel, differing from both the lobster and the crab. The very large ones are exported as prawns.

Shrimp are canned dry, or in weak brine, the latter preserving their delicacy of texture and flavor better than the former. The cans are

lined with parchment paper to minimize the development of dark spots. Packing is done in No. 1 tall and No. 2 cans.

Tuna (*Thunnus thynnus*).

The tuna is caught and canned on the southern coast of California, the canneries being located at the ports of Los Angeles and San Diego. Tuna is a new product of the highest quality, though prepared from a fish that only a few years ago was considered of inferior quality. The fish are handled fresh, are cooked before being put in the can, and their natural oil is removed and its place taken by olive oil. The result is a very characteristic flavor, so much like the breast meat of chicken that it has been styled "the chicken of the sea."

Tuna comes in two grades, the regular or large white pieces, and the mixture of white and dark meat, the latter usually ground and spiced and called potted tuna.

MEATS.

The canning of meats is more carefully safeguarded than any other line, as all animals are given an ante and post mortem inspection; besides, the curing of the meat and the subsequent canning are done under Government supervision. There has been a popular, though erroneous, notion that only the poorer animals and the meats which would bring a low price were canned. It is in part to combat this notion and to insure the public against injury from unfit material that the packing is confined to establishments under Federal inspection.

There is a large variety of meats canned, but nearly all require a preliminary curing or cooking. The meat, as it is marketed in the can, has lost from 20 to 50 per cent of its water, and is, therefore, more concentrated than the fresh meat from the butcher's block. Canned meats have their excess fat, bone, and cartilage trimmed off, so there is no waste. These two factors, loss of weight due to water eliminated in canning and cooking and loss of weight due to trimming, make the canned meat appear to be much more costly than the fresh, when in reality the difference may be small.

Meats are packed in large cuts which will just fit the can, and are designated by such names as roast beef, brisket beef, cottage beef, or in the case of a mild, sweet cured meat, as corned beef. The meat may be rather coarsely cut and mixed with cereal, and is then known as beef, veal, or ham loaf, as the case may be. Chopped corned beef seasoned and mixed with potatoes is known as corned-beef hash. Finely ground meats with or without the addition of a small quantity of cereal and highly spiced are the potted or deviled; and ground meats, either straight or mixed in the form of sausages, are known after the style in which they are sold fresh.

Tongue is packed whole, steak with onions, liver with bacon, kidneys stewed, and meat mixed with vegetables, as Irish stew. Poultry is packed

A view in a typical meat-packing plant.

boned. The fowls are given sufficient cooking so that the flesh may be stripped from the bones and packed in large pieces, or it may be chopped or ground.

OTHER PRODUCTS.

Chili con Carne.

There are two styles of the Mexican dish known as chili con carne, the hot and the mild. The former is composed of beef cut into small cubes and mixed with a heavy chili sauce. This is further spiced by the addition of black pepper. The mild chili con carne is made of beef and chili sauce without pepper and has the addition of red kidney beans or frijoles. Packing is done in 5 and 7 ounce cans.

Chop Suey.

Canned chop suey is quite different from the Chinese article and by the majority of Americans the substitute is preferred. It consists of chicken, veal, pork, rice, bean sprouts, and the proper flavoring. It makes a decidedly rich and pleasing combination. The manufacture is under the supervision of Chinese chefs.

Enchilada.

This Mexican dish is similar to the tamale, but when canned, instead of having the lining made of ordinary corn meal, it is made from rather coarse freshly prepared lye hominy meal. The meat and sauce are essentially the same as in the tamale. Packing is done in 5 and 7 ounce cans.

Ravioli.

The canned ravioli is an attempt to simulate the Italian dish of that name. Instead of the meat being placed between two layers of paste and cooked, the meat and its sauce and the paste are prepared separately. The paste is cut into the usual squares and filled into the can with the meat. Packing is done in 7-ounce cans.

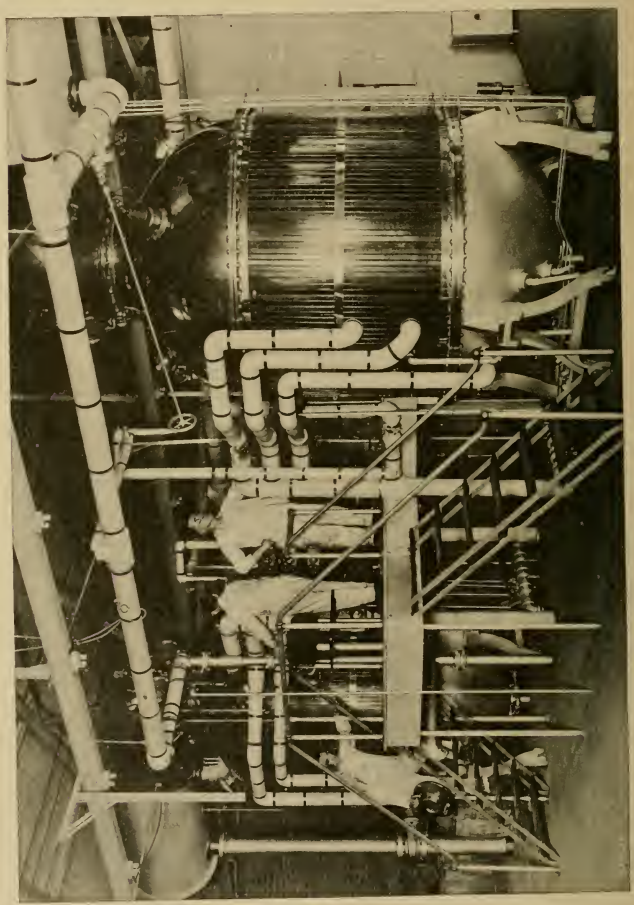
Tamales.

The canning of tamales has developed with the introduction of some dishes prepared according to the Mexican style of cookery. The tamale is canned in two styles, plain and Mexican. In the plain tamale the can is lined with a heavy batter of corn meal, made by cooking the meal in the beef broth, and the center of the can is filled with meat, olives, chili, and spices. The meat may be chicken, veal, or beef, and the tamale is designated by the kind of meat used. In the Mexican style the same ingredients are used, but they are layered and wrapped with clean soft corn husks. The latter give the characteristic flavor. The plain style is preferred when canned.

The packing is done in the tamale can, which has been designed to hold sufficient for one service for a laboring man or two or three services for persons of sedentary habits. The use of the tamale is growing with considerable rapidity.

Milk.

The manufacture of evaporated and condensed milk is of American origin. The persistent work on the part of Mr. Gail Borden brought him the reward of a patent upon the process of reducing milk in vacuo in



The great vacuum pans used in evaporating or concentrating milk. Uniformity and high quality is assured.

1856. The earlier method depended upon the addition of sugar to the milk to insure preservation, and sterilization by heat without sugar came as a later development. The work which has been done since has been mainly in improving the mechanical apparatus used.

Milk is the most perishable of all food products packed in tin containers. It is a perfect food and a good medium for many forms of organisms, breaking down readily under their activity. Milk which has undergone even slight change can not be used for evaporating, as it will not make a merchantable product. It is therefore necessary to obtain the milk from large herds, to make rigid inspection for disease, to control the feed, to require cleanliness in handling, rapid cooling of the milk, and prompt delivery to the factory. The milk is evaporated to a standard consistency in a vacuum pan, each batch being tested to insure that it be of legal standard in fat and in solids not fat.

Evaporated milk is milk from which a part of the moisture has been removed and which contains not less than 7.5 per cent of butter fat and 25.5 per cent total solids. It is packed in cans containing 6, 12, and 16 ounces (170, 340, and 454 grams).

Condensed milk is milk from which a part of the moisture has been removed and sugar added for its preservation.

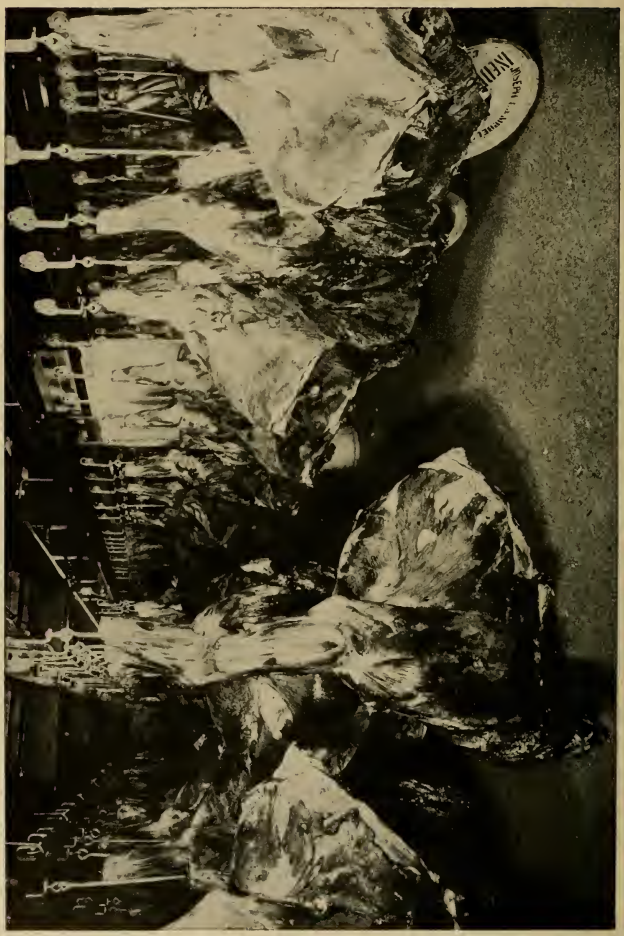
Natural milk is a new product being placed upon the market. It consists of whole milk which has been homogenized and then sterilized.

Soups.

Soup is prepared in a variety of ways and represents in many cases the best results of skillful chefs. Soup canning, like meat canning, is carried on at only a few factories, as the majority of soups contain meat stock in sufficient quantity to require the presence of a Government inspector in the plant. Soups, more than any other line, represent the blending of products and seasoning by the skillful cook or chef. The factory has the advantage of being able to select high-grade material in large quantity, to have special machinery for its preparation, of being able to control the temperature to a nicety in the cooking, and, by the aid of experts, to be able to make a better and more economical product than can be prepared in the home.

For a long time soup had been looked upon as a product which anyone could prepare in the kitchen from the cheaper cuts of meat and the left-over odds and ends of vegetables, and because of this view and the indifferent quality of the resultant product a kind of natural popular prejudice was created against the canned article. This has been broken by sheer force of superior quality in the latter, and in no other line has such rapid progress been made in the past few years. The vegetable soups, such as asparagus, celery, pea, and tomato are packed only during the season when the fresh vegetables are available, and not from bulk stock, as many suppose.

Soups are divided into two classes, light and condensed. The former are ready to serve without the addition of an agent such as water or milk. These are chiefly beef, mutton, veal, chicken, and clam broths



The kind of meats used in soups and in canning. It is not the trimmings or joints as used in the home preparation of soup stock.

or bouillon, and are often prescribed for invalids. They are packed in 8, 16, 32 ounce, and No. 10 cans.

The condensed soups require the addition of an equal volume or more of water or, in some cases, milk. They are:

Asparagus.	Ox tail, thick.	Tomato-okra.
Beef.	Celery.	Chicken gumbo.
Bouillon.	Consomme.	Clam bouillon.
Julienne.	Chicken.	Clam chowder.
Mock turtle.	Pea.	Vegetable, clear.
Mulligatawney.	Pepper pot.	Vegetable, thick.
Mutton.	Printanier.	
Ox tail, clear.	Tomato.	

The foregoing are packed in No. 1 cans, containing 10½ ounces (298 grams). The beef, clam chowder, mutton, ox tail, tomato, and vermicelli are also packed in No. 10 cans, containing 7 pounds (3.18 kilos).

The United States Bureau of Animal Industry does not permit soups bearing the meat inspection legend to be packed in cases with other goods not bearing the legend; therefore mixed cases can not be made of the two classes. The soups bearing the meat inspection legend are:

Beef.	Mutton.
Bouillon.	Ox tail.
Consomme.	Pepper pot.
Julienne.	Printanier.
Mock turtle.	Vegetable.

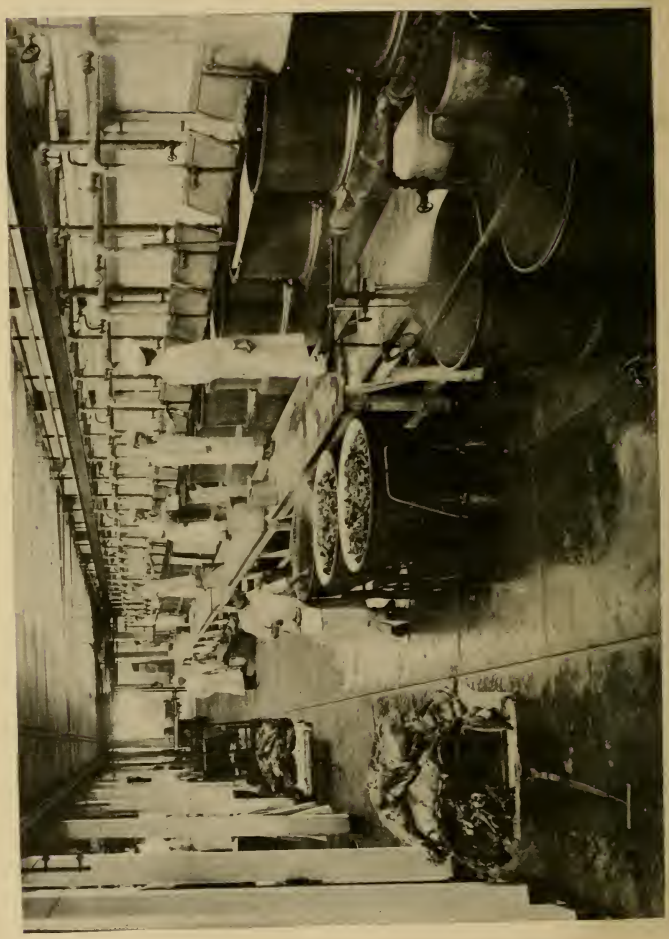
Pork and Beans.

One of the most nutritious products packed in the tin can is pork and beans. The beans used for this purpose are the small white pea or navy beans, and those grown in Michigan, Wisconsin, and New York are given the preference. If any other variety of bean be used, the fact must be disclosed upon the label.

If the beans be subjected to dry heat, as in an oven, before they are placed in the cans, they are known as baked beans, and if olive oil be substituted for the bit of pork, they are known as beans vegetarian style. Pork and beans, baked beans, or beans vegetarian style may be obtained with a plain spice sauce or with tomato sauce, about 90 per cent being packed with the latter. The packing is done in No. 1½ and in 16, 20, and 34 ounce cans.

Red Kidney Beans.

The red kidney bean is much larger than the white bean and has quite a distinctive flavor. It is growing in favor almost as rapidly as the white bean. In the South and Southwest the sauce is prepared with chili.



View in a large soup kitchen.

Hominy.

Lye hominy is one of the old staples much appreciated by men engaged in hard physical labor, such as mining, railroad construction, logging, and ranching. It has not been canned until recent years, but has become popular not only among the laborers but among many others as a breakfast food. Pearl hominy, the kind in which the hull is removed from the grain by machinery, is also canned, but is not nearly so popular as the old style whole grain. Packing is done in No. 2 and No. 3 cans.

Corn-meal Mush.

Ground corn meal is given a very prolonged boiling in open kettles until it acquires a heavy consistency, popularly known as mush. When cold it makes a solid mass which, on account of the cylindrical shape imparted by the can, permits attractive slices to be cut for frying. It is packed in No. 3 cans.

Kraut.

The canning of sauer kraut has come about in response to the demand for a more sanitary method of handling. The open barrel or keg permitted the handling of the kraut by hands none too clean from other work, and added to this was a constant tendency to spoilage on the surface. Canning not only eliminates the insanitary feature but conserves waste to a degree sufficient to pay for the extra cost of packing. It is packed in No. 2½ and No. 3 cans.

Spaghetti.

Spaghetti is an Italian style of paste which has been growing steadily in popularity since its introduction into the United States. Most persons do not understand the best methods or do not have the necessary material for its preparation, so that the canned product makes a properly prepared article available to them. It is packed in cans holding 11 and 21 ounces.

APPENDIX.

PARTIAL LIST OF CANNED FOODS, WITH SIZE AND NET CONTENTS OF THE CANS, NUMBER OF CANS IN A CASE, GROSS AND LEGAL WEIGHTS OF THE CASE, NET WEIGHT OF CONTENTS OF CANS IN THE CASE, AND DIMENSIONS OF THE CASE.

PRODUCTS PACKED IN TIN.

Product.	Cans in case.		Net weight of contents of can.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds.	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Apples	24	2½	26	735	59	26.7	49	22.2	40	17.8	18¼	46.4	13¼	33.7	10½	26.7
Do	24	3	29	820	63	28.6	52	23.6	44½	20.2	19	48.3	14	35.6	11¼	28.6
Do	6	10	96	2,720	53	24.0	45	20.4	38	17.7	20½	52.1	13⅜	33.7	7⅞	20.0
California fruits: [a]																
Extra	24	2½	30	850	63	28.6	53	24.0	46	20.9	18¼	46.4	13¼	33.7	10½	26.7
Extra standard and standard	24	2½	29	825	62	28.1	52	23.6	45	20.4	18¼	46.4	13¼	33.7	10½	26.7
Seconds, water	24	2½	28	795	60	27.2	50	22.7	43	19.5	18¼	46.4	13¼	33.7	10½	26.7
Extra extra standard	24	3	36	1,020	77	34.9	66	29.9	54	24.5	19	48.3	14	35.6	11¼	28.6
Do	6	10	104	2,950	54	24.3	46	20.9	42	19.1	20½	52.1	13¼	33.7	7⅞	20.0
Standard and water	6	10	100	2,835	53	24.0	45	20.4	40	18.1	20½	52.1	13¼	33.7	7⅞	20.0
Raspberries	48	1	11	310	49	22.2	41	18.6	34	15.4	18¼	47.0	12	30.5	8¾	22.2
Do	48	oz. 16	15	425	68	30.8	58	26.3	47	21.3	20¼	51.4	13	33.0	10¼	26.0
Pears and plums	48	16	14	395	63	28.6	53	24.0	43	19.5	18¼	46.4	13⅜	34.0	10⅞	27.6
Do	24	2	20	567	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Blueberries	24	2	20	565	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	3	33	935	72	32.6	61	27.7	53	24.0	19	48.3	14	35.6	11¼	28.6
Do	6	10	106	3,060	54	24.5	46	20.8	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0
Cherries, pitted	24	2	20	565	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Cherries	24	2½	29	820	62	28.1	52	23.6	45	20.4	15¾	40.0	11¼	28.6	10	25.4
Do	6	10	105	2,975	56	24.9	46	20.8	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0

Figs	48	1	11	310	49	22.2	41	18.6	34	15.4	18½	47.0	12	30.5	8¾	22.2
Do	24	2	20	565	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	6	10	104	2,945	54	24.0	46	20.8	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0
Gooseberries	24	2	20	565	44	19.6	37	16.8	31	13.8	15¾	40.0	11¼	28.5	10	25.4
Do	6	10	103	2,920	54	24.3	46	20.9	40	18.1	20½	52.1	13¼	33.7	7⅞	20.0
Pineapples	48	1	12	340	53	24.0	45	20.4	38	17.2	18½	47.0	12	30.5	8¾	22.2
Do	48	Squat.	9	255	46	20.9	36	16.3	26	11.8	15¾	40.0	11¼	28.6	10	25.4
Do	48	Tall.	13	370	60	27.2	50	22.6	39	17.7	20¼	54.0	13	33.0	10¼	26.0
Do	36	flat 2	19	540	60	27.2	50	22.7	44	20.0	18¼	46.4	13	33.0	10½	29.2
Do	24	2	20	565	44	20.0	37	16.8	31	14.1	15¾	40.0	11¼	28.6	10	25.4
Do	24	2½	30	850	63	28.6	53	24.0	45½	20.6	18¼	46.4	13¼	33.7	10½	29.2
Do	6	10	110	3,115	54	24.3	47	22.3	42	19.0	20¾	52.7	13⅜	34.0	7½	19.1
Olives	24	2½	29	255	68	30.8	58	26.3	26	11.8	20¼	51.4	13	33.0	10¼	26.0
Do	24	2½	34	965	63	28.6	53	24.0	28	12.7	18¼	46.4	13¼	33.7	10½	26.7
Jams	48	1	14	395	57	25.9	49	22.2	42	19.1	18½	47.0	12	30.5	8¾	22.2
Do	24	flat 2	24	680	49	22.2	42	19.1	36	16.3	18¼	46.4	13¼	33.7	7¼	18.4
Do	24	2	24	680	49	22.2	42	19.1	36	16.3	15¾	40.0	11¼	28.6	10	25.4
Artichokes	24	3	32	905	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Do	6	10	102	2,890	53	24.0	45	20.4	40	18.1	20½	54.6	13¼	33.7	7⅞	20.0
Asparagus	24	sq. 1	16	450	37	16.8	30	13.6	24	10.9	13⅞	35.2	11¾	29.8	8	20.3
Do	24	2	20	565	43	19.5	36	16.3	30	13.6	15¾	40.0	11¼	28.6	10	25.4
Do	24	sq. 2½	31	880	65	29.5	54	24.5	46½	21.1	16⅞	41.0	15¾	40.0	10	25.4
Do	24	rd. 3	32	905	72	32.7	61	27.7	53	24.0	19	48.3	14	35.9	11¼	28.6
Do	6	10	100	2,835	53	24.0	45	20.4	40	18.1	20½	54.6	13¼	33.7	7⅞	20.0
Beans, wax and refugee	48	1	11	310	49	22.2	41	18.6	34	15.4	18½	47.0	12	30.5	8¾	22.2
Do	24	2	19	540	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	3	31	880	71	32.2	60	27.2	51	23.1	19	48.3	14	35.9	11¼	28.6
Do	6	10	105	2,976	53	24.0	45	20.4	40	18.1	20½	54.6	13¼	33.7	7⅞	20.0
Beans, red kidney and lima	48	1	11	310	49	22.2	41	18.6	34	15.4	18½	47.0	12	30.5	8¾	22.2
Do	24	2	20	565	43	19.5	36	16.3	30	13.6	15¾	40.0	11¼	28.7	10	25.4
Do	24	3	32	905	72	32.7	61	27.7	53	24.0	19	48.3	14	35.9	11¼	28.6
Do	6	10	105	2,975	54	24.5	46	20.9	41	18.6	20½	54.6	13¼	33.7	7⅞	20.0

[a] California fruits include, among others, apricots, blackberries, white and black eherries, grapes, loganberries, peaches, and strawberries. They are carefully graded. Those with the heavier sirup give a heavier weight per ease, and this is indieated by the grade without repeating the names of the fruits.

Product.	Cans in case.		Net weight of contents of can.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds.	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Beans, baked	48	1	10½	295	44	19.6	36½	16.6	33	15.0	18½	47.0	12	30.5	8¾	22.2
Do	24	.....	16	450	39¼	17.8	32⅞	14.9	27¾	12.6	20¼	51.4	13	33.0	10¼	26.0
Do	36	.....	16	450	59	26.8	51½	23.4	43	19.8	20¼	51.4	13	33.0	10¼	26.0
Do	24	2	20	565	43⅞	19.9	37	16.8	32⅝	14.8	15¾	40.0	11¼	28.6	16	25.4
Do	36	2	20	565	65	29.4	57⅜	26.0	48⅞	22.2	15¾	40.0	11¼	28.6	16	25.4
Do	24	3	34	960	72½	32.9	62½	28.4	51	23.2	19	48.3	14	35.6	11¼	28.6
Do	6	10	106	3,005	50	22.7	47	21.9	43⅛	30.0	20½	54.6	13¼	33.7	7⅞	20.0
Beets	24	2	20	565	44	20.0	37	16.8	31	14.1	15¾	40.0	11¼	28.6	10	25.4
Do	24	3	33	935	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Do	6	10	106	3,005	54	24.5	46	20.9	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0
Cabbage	24	3	32	905	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Cauliflower	24	3	32	905	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Corn	48	1	11	310	49	22.2	41	18.6	34	15.4	18½	47.0	12	30.5	8¾	22.2
Do	24	2	20	565	44	20.0	37	16.8	31	14.1	15¾	40.0	11¼	28.6	10	25.4
Do	6	10	106	3,005	54	24.5	46	20.9	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0
Hominy	24	2½	31	880	69	31.3	58	26.3	50	22.7	18¼	46.4	13¼	33.7	10½	26.7
Do	24	3	33	935	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Do	6	10	107	3,035	54	24.5	46	20.9	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0
Okra	24	2	19	540	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	3	33	935	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Do	6	10	103	2,920	53	25.0	45	20.4	40	18.1	20½	52.1	13¼	33.7	7⅞	20.0
Okra and tomatoes	24	2	19	540	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	3	33	935	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Peas	100	oz. 6	6	170	60	27.2	48	21.8	38	17.2	23¾	60.3	12	30.5	8½	21.6
Do	48	1	11	310	49	22.2	41	18.6	34	15.4	18½	47.0	12	30.5	8¾	22.2
Do	24	oz. 16	15	425	34	15.4	29	13.2	24	10.9	20¼	51.4	13	33.0	10¼	26.0
Do	24	2	20	565	44	20.0	37	16.8	31	14.1	15¾	40.0	11¼	28.6	10	25.4

Do	6	10	108	3,060	54	24.5	46	20.9	41	18.6	20½	52.1	13¼	33.7	7⅞	20.0
Pumpkin	24	2	19	540	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	2½	30	850	64	29.0	53	24.0	46	20.9	18⅛	46.4	13¼	34.0	10½	26.7
Do	24	3	33	935	70	31.8	59	26.8	51	23.1	19	48.3	14	35.6	11¼	28.6
Do	10	6	104	2,945	53	25.0	45	20.4	40	18.1	20½	52.1	13¼	33.7	7⅞	20.0
Rhubarb	24	2½	31	880	65	29.5	54	24.4	47	21.3	18¼	46.4	13¼	33.7	10½	26.7
Do	6	10	100	2,835	53	24.0	45	20.4	40	18.1	20½	52.1	13¼	33.7	7⅞	20.0
Sauerkraut	24	2	19	540	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	2½	29	820	62	28.1	52	23.6	45	20.4	18¼	46.4	13¾	34.9	10½	26.7
Do	24	3	32	905	72	32.9	61	27.7	53	24.0	19	48.3	14	35.9	11¼	28.6
Do	6	10	100	2,835	53	24.0	45	20.4	40	18.1	20½	54.6	13¼	33.7	7⅞	20.0
Spinach	24	2	19	590	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	2½	28	795	61	27.7	51	23.1	44	20.0	18¼	46.4	13¾	34.9	10½	26.7
Do	24	3	30	850	69	31.3	58	26.3	50	22.7	19	48.3	14	35.6	11¼	28.6
Do	10	6	100	2,835	53	24.0	45	20.4	40	18.1	20½	54.6	13¼	33.7	7⅞	20.0
Squash, same as pumpkin.																
Succotash, same as corn.																
Sweet potatoes	24	2½	28	795	61	27.7	51	23.1	44	20.0	18¼	46.4	13¼	33.7	10½	26.7
Do	24	3	31	880	69	31.3	58	26.3	50	22.7	19	48.3	14	35.6	11¼	28.6
Do	10	6	100	2,835	53	24.0	45	20.4	40	18.1	20½	52.1	13¼	33.7	7⅞	20.0
Tomatoes, tomato sauce	72	.....	9	255	58	26.3	49	22.2	40	18.1	18	45.7	11⅝	29.5	10¾	27.3
Do	100	.....	6	170	80	36.3	66	29.9	50	22.7	23¾	60.3	12	30.5	8½	21.6
Do	48	1	11	312	49	22.2	41	18.6	34	15.4	18½	47.0	12	30.5	8¾	22.2
Do	48	oz. 16	15	425	68	30.8	58	26.3	47	21.3	18¼	46.4	13⅜	34.0	10⅞	27.6
Do	24	2	19	540	41	18.6	34	15.4	28	12.7	15¾	40.0	11¼	28.6	10	25.4
Do	24	2½	28	795	60	27.2	50	22.7	43	17.5	18¼	46.4	13¾	34.9	10½	26.7
Tomatoes	24	3	33	935	72	32.7	61	27.7	53	24.0	19	48.3	14	35.9	11¼	28.6
Do	24	5½	38	1,075	78	35.4	67	30.3	59	26.8	19	48.3	14	35.9	12½	31.8
Do	6	10	103	2,920	52	23.6	44	20.0	40	18.1	20½	54.6	13¼	33.7	7⅞	20.0
Pimientas	100	.....	7	200	74	33.6	60	27.2	44	20.0	17	43.2	13¼	33.7	12¾	32.4
Crab meat	48	.....	4	115	24	10.9	19	12.1	12	5.4	12½	31.8	8⅞	22.5	8¾	22.2
Do	24	.....	8	225	22	10.0	17	7.7	12	5.4	15½	39.4	11¼	28.6	5½	14.0
Do	48	.....	8	225	40	18.1	32	14.5	24	10.9	15½	39.4	11¼	28.6	10	25.4
Crab shells (for serving)	48	.....	4	113	7	3.1	.....	.....	.....	.....	17	43.2	12¼	31.1	11½	5.1
Do	24	.....	8	226	8	3.6	.....	.....	.....	.....	17	43.2	14	35.9	12½	5.6

Product.	Cans in case.		Net weight of contents of can.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds.	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Tuna	48	.....	3½	99	.....	.....	.....	.....	24	10.9	.....	.....	.....	.....	.....	.....
Do	48	.....	7	199	40	18.1	32	14.5	24	10.9	16	40.7	11½	29.2	11¼	28.6
Do	48	.....	13	368	70	31.8	58	26.3	40	18.4	.....	.....	.....	.....	.....	.....
Oysters	72	.....	3	85	46	20.9	41	18.6	14	6.4	17¾	45.1	11¾	29.8	9¼	23.5
Do	48	.....	4	113	39	17.7	34	15.4	12	5.4	17¾	45.1	11¾	29.8	8½	21.6
Do	48	.....	5	141	46	20.9	41	18.6	15	6.8	17¾	45.1	11¾	29.8	9	22.9
Do	24	.....	6	170	32	14.5	27	12.2	9	4.1	15½	39.6	11¼	28.6	7⅝	19.4
Do	24	.....	8	226	36	16.3	31	14	12	5.4	15½	39.6	11¼	28.6	8¾	22.2
Do	24	.....	10	283	42	19.1	37	16.8	15	6.8	17¾	45.1	11¾	29.8	9	22.9
Do	48	tall 1	6	170	49	22.2	44	20.0	18	8.1	17¾	45.1	11¾	29.8	9¾	24.1
Do	24	tall 2	12	340	45	20.4	40	18.1	18	8.1	15¼	39.1	11¼	28.6	10½	26.7
Shrimp	48	1	4½	27	28	12.7	21	9.5	14	6.4	17⅞	46.0	11¾	29.8	9⅛	23.6
Do	24	1½	8½	.....	25	11.3	19	12.1	13	5.9	13½	54.9	10⅛	25.7	7⅞	20.0
Shrimp, dry	48	1	4½	125	28	12.7	22	10.0	15	6.8	17⅞	46.0	11¾	29.8	9⅛	23.6
Do	24	1½	8½	240	25	11.3	21	9.5	13½	6.1	15½	39.3	11¼	28.6	8¾	22.2
Shrimp, wet	48	1	4½	125	46	20.9	40	18.1	33	15.0	17⅞	4.6	11¾	29.8	9⅛	23.6
Do	24	1½	8½	240	37	16.8	33	15.0	25½	11.5	15½	39.3	11¼	28.6	8¾	22.2
Salmon	48	tall 1	16	450	69	31.3	60	27.2	48	21.8	20¼	54.0	13	33.0	11⅛	28.3
Do	48	flat 1	16	450	69	31.3	62	28.1	48	21.8	18	45.7	13¼	33.7	11⅛	28.3
Do	48	flat ½	8	225	40½	18.4	41	18.6	24	10.9	16	40.6	11½	29.2	11¼	28.6
Fish flakes	48	½	8	225	42	19.0	34	15.4	24	10.9	18	45.7	12⅛	30.8	7⅛	18.1
Do	48	oz. 12	12	340	72	32.7	60	27.2	36	16.3	15½	39.4	14¾	37.5	10⅜	26.4
Sardines	100	4	4	110	55	24.4	46	20.6	25	11.3	23¾	60.3	13¼	33.7	6½	16.5
Do	50	¾	14	340	57	25.8	47	21.3	75	34.0	10⅜	49.9	10⅜	26.4	11¾	29.8
Shad roe	48	oval 1	15	425	70	31.8	60	27.2	45	20.4	19⅜	49.9	13¾	34.9	10⅛	25.7
Do	48	oval 1½	7½	210	40	18.1	32	14.5	22½	10.2	18¼	46.4	14¾	37.5	5⅞	14.9
Corned beef	24	½	8	225	19	8.6	16¼	7.4	12	5.4	14⅞	37.8	7⅛	18.1	5⅞	14.9

Do	48	½	8	225	38½	17.5	32½	14.7	24	10.9	15⅜	39.7	13½	34.3	5⅞	14.9
Do	96	½	8	225	72¼	32.8	65	29.5	48	21.8	15½	39.4	13⅜	34.0	10⅞	27.6
Do	24	1	12	340	27	12.2	23½	10.7	18	8.2	15¼	38.7	7⅛	18.1	8	20.3
Do	48	1	12	340	53	24.0	47	21.3	36	16.3	15¼	38.7	13¼	33.7	8	20.3
Do	12	2	24	680	26	11.8	22	10.0	18	8.2	18	45.7	9½	24.1	5	12.7
Do	24	2	24	680	50	22.7	45	20.4	36	16.3	18½	47.0	9⅛	24.1	9½	24.1
Do	12	6	96	2,720	96¼	43.7	82	37.2	72	32.7	23¾	60.3	13½	34.3	10½	26.7
Do	6	14	224	6,350	112	50.8	93	42.2	84	38.1	17⅞	43.5	15⅜	39.7	14¾	37.5
Cottage beef	24	1	12	340	28	12.7	24¼	11.0	18	8.2	20¼	51.4	10⅜	26.4	4⅜	11.1
Do	48	1	12	340	56	25.4	45	20.4	36	16.3	20½	52.1	10⅝	27.0	8⅝	21.9
Do	12	2	24	680	26	11.8	22½	10.2	18	8.2	18¼	46.4	9⅜	23.8	5	12.7
Brisket beef	24	1	12	340	29	13.2	24½	11.1	18	8.2	15⅜	39.0	11¼	28.6	5½	14.0
Do	12	2	25	710	27¼	12.4	24½	11.1	18⅜	8.5	13	33.0	11⅞	30.2	6	15.2
Do	24	2	24	680	52	23.6	46½	20.9	36	16.3	23½	59.7	12	30.5	6	15.2
Beef loaf	24	.....	7	200	20½	9.3	16½	7.5	10½	4.8	13½	34.3	9⅝	24.5	6	15.2
Chicken loaf	24	.....	7	200	20¼	9.2	16½	7.5	10½	4.8	13½	34.3	9⅛	24.1	5⅞	14.9
Ham loaf	24	.....	7	200	19¾	8.9	16½	7.5	10½	4.8	13½	34.3	9⅛	24.1	5⅞	14.9
Veal loaf	24	.....	7	200	20¼	9.2	16½	7.5	10½	4.8	13½	34.3	9⅝	24.5	5⅜	13.7
Do	48	.....	7	200	39	17.7	33	15.0	21	9.6	19⅝	49.9	11½	29.2	5¾	14.6
Beef, chicken, ham, veal loaves	12	6	84	2,380	92	41.7	73	33.1	63	28.6	24	60.9	13¾	34.9	10½	26.7
Ox tongues	12	1½	22	625	27¾	12.6	22¼	10.1	16½	7.5	18¼	46.4	11⅞	30.2	5¼	13.3
Do	24	1½	22	625	53	24.0	48½	20.2	33	15.0	23⅞	60.1	12⅛	30.8	7½	19.0
Do	24	2	30	850	67½	30.6	58	26.3	45	20.4	23⅞	60.6	12	30.5	9⅜	23.8
Do	12	2	30	850	34¾	15.8	29	13.2	22¼	10.2	18½	47.0	12	30.5	6½	16.5
Do	12	2½	38	1,075	45	20.4	39	17.7	28½	12.9	20¼	51.4	13¼	33.7	6⅞	17.5
Do	24	2½	38	1,075	90¼	40.9	78½	35.6	57	25.9	26½	67.3	13⅝	34.6	10¼	26.0
Do	12	6	96	2,720	97¾	44.3	81½	37.0	72	32.7	26⅜	67.0	19¾	50.2	6¼	15.9
Lunch tongues	24	½	6½	185	18¾	8.5	15	6.8	9¾	4.4	15⅜	39.1	11⅜	28.9	4⅜	11.1
Do	48	½	6½	185	35¼	16.0	30	13.6	19½	8.8	15¾	40.0	11⅜	28.9	8	20.3
Do	24	1	12	340	30¾	13.9	26	11.8	18	8.2	19⅜	48.6	13⅞	35.2	5⅛	13.0
Do	24	2	24	680	60	27.2	49	22.2	36	16.3	23¾	60.3	12¼	31.1	9½	24.1
Do	48	1	12	340	61¼	27.8	52	23.6	36	16.3	19¼	48.9	14⅛	35.9	9¾	24.8
Do	12	2	24	680	29½	13.4	24½	11.1	18	8.2	18¼	46.4	11⅞	30.2	6	15.2
Breakfast tongues	48	½	6½	185	35½	16.1	30½	13.8	19½	8.8	15¾	40.0	11⅜	28.9	8½	21.6

PRODUCTS PACKED IN TIN—Continued.

Product.	Cans in case.		Net weight of contents of can.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds.	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Breakfast tongues	24	1	12	340	31¾	13.4	25	11.3	18	8.2	19	48.3	13⅞	35.2	5⅛	13.0
Do	48	1	12	340	62	28.1	50	22.7	36	16.3	19¼	48.9	14⅛	35.9	10⅜	26.4
Sheep tongues	24	1	12	340	31½	13.3	28	12.7	18	8.2	19⅛	48.6	13¾	34.9	5	12.7
Do	48	1	12	340	60¾	27.6	56	25.4	36	16.3	19⅛	48.6	14	35.6	9⅜	23.8
Vienna sausage	24	½	5	140	13	5.9	11	5.0	7½	3.4	11¾	29.8	8⅜	21.3	5⅞	14.9
Do	48	½	5	140	25¾	11.7	22	10.0	15	6.8	16¾	42.5	10¾	27.3	5¾	14.6
Do	24	1	11	310	27	12.2	21½	9.7	16½	7.5	14⅛	35.9	10	25.4	7⅞	20.0
Do	24	2	24	680	53½	24.3	44	20.0	36	16.3	19⅞	50.5	13⅞	35.2	8⅜	21.3
Do	48	1	11	310	52½	23.8	43	19.5	33	15.0	20⅛	51.1	13⅜	34.0	8	20.3
Vienna sausage, tomato sauce	24	½	5	140	12¾	5.8	11	5.0	7½	3.4	11¾	29.8	8⅜	21.3	5¾	14.6
Do	48	½	5	140	26	11.8	22	10.0	15	6.8	16¾	42.5	10¾	27.3	5¾	14.6
Vienna sausage, German style	24	½	5¾	165	16½	7.5	14	6.4	8⅝	3.9	15¾	40.0	11⅜	28.9	4⅜	11.1
Oxford sausage	24	1	16	455	38	17.2	34¼	15.5	24	10.9	19¾	50.2	10¾	27.3	6¼	15.9
Frankfurt sausage	24	1	19½	550	42¾	19.4	36½	16.6	29	13.2	20⅝	51.1	13⅛	33.3	6½	16.5
Do	48	1	19½	550	87½	39.7	74	33.6	58	26.3	26⅜	67.0	9⅞	25.1	7	17.8
Do	12	2	39	1,105	40	18.1	34	15.4	29¼	13.4	19¼	48.9	13⅞	35.2	6¼	15.9
Do	24	2	39	1,105	80	36.3	68	30.8	58½	26.5	19⅛	48.6	14⅛	35.9	12¼	31.1
Sausage meat	24	½	5½	155	14	6.4	11¼	5.1	8¼	3.7	11¾	29.8	8⅜	21.3	5⅞	14.9
Do	24	1	13	370	32¾	14.9	27	12.2	19½	8.8	20⅛	51.1	13⅛	33.3	5¼	13.3
Do	48	1	13	370	64	29.0	54	24.5	39	17.7	20¼	51.4	13½	34.3	9¾	24.8
Do	12	2	24	680	26½	12.0	22	10.0	18	8.2	19	48.3	13¾	34.9	4½	11.4
Do	24	2	24	680	52	23.6	42	19.1	36	16.3	19⅜	48.6	13⅞	35.2	8⅛	20.6
Bologna sausage	24	1	18½	240	40	18.1	35	15.9	27⅜	12.4	16¾	42.5	10⅞	27.6	8½	21.6
Do	12	2	24	680	28	12.7	22	10.0	18	8.2	19¼	48.9	13⅞	35.2	4⅜	11.1
Do	24	2	24	680	52	23.6	44	19.9	36	16.3	19⅛	48.6	13⅝	34.6	8	20.3

Sauer kraut and sausage....	12	2	21	595	26¼	12.0	19½	8.8	15¾	7.1	14⅝	37.2	9½	24.1	7⅜	18.7
Do.....	24	2	21	595	46¼	21.0	39½	18.0	31½	13.3	19¼	48.9	13⅞	35.2	7⅜	18.7
Roast beef.....	24	1	12	340	30¾	13.9	25	11.3	18	8.2	19⅜	48.6	13⅞	35.2	5⅛	13.4
Do.....	48	1	12	340	62	28.1	49	22.3	36	16.3	20	50.8	14¼	36.2	10	52.0
Do.....	12	flat 2	24	680	28⅝	12.9	24	10.9	18	8.2	18⅜	46.7	11¾	29.8	6	15.2
Do.....	24	flat 2	24	680	57	25.9	48	21.8	36	16.3	23¾	60.3	12⅛	30.8	9¼	23.5
Do.....	12	tall 2	24	680	27¼	12.4	22½	10.2	18	8.2	19	48.3	13¾	34.9	4⅜	11.1
Do.....	24	tall 2	24	680	53	24.0	45½	20.7	36	16.3	19⅛	48.6	13⅞	35.2	8¼	21.0
Do.....	12	6	96	2,720	98	44.5	84	38.1	72	32.7	26½	67.3	19⅞	50.5	7½	19.1
Roast mutton.....	24	flat 1	12	340	29½	13.4	25½	11.6	18	8.2	19⅛	48.6	13¾	34.9	5	12.7
Do.....	48	flat 1	12	340	62	28.1	51	23.1	36	16.3	19¼	48.9	14¼	36.2	9⅞	25.1
Do.....	12	flat 2	24	680	28¾	13.0	23	10.4	18	8.2	18¼	46.4	11⅞	30.2	6	15.2
Do.....	24	flat 2	24	680	57	25.9	48	21.8	36	16.3	23¾	60.3	12⅝	30.8	9¼	23.5
Do.....	24	tall 2	24	680	51½	23.3	45½	20.7	36	16.3	19⅛	45.6	13¾	34.9	8¼	21.0
Do.....	12	6	96	2,720	97¾	44.3	83½	37.9	72	32.7	26½	67.3	20	50.8	7½	19.1
Minced collops.....	24	1	16	450	36¼	16.4	29	13.2	24	10.9	20⅛	51.1	13¼	33.7	5⅜	13.0
Do.....	48	1	16	450	70	31.8	58	26.3	48	21.8	20⅛	51.1	13⅝	34.6	10⅜	25.7
Do.....	12	2	25	710	28¾	13.0	23¼	10.5	18¾	8.5	19¼	48.9	13⅞	35.2	4½	11.4
Minced steak.....	24	1	16	450	36	16.3	29	13.2	24	10.9	13¼	33.7	13¼	33.7	9¼	23.5
Do.....	48	1	16	450	70	31.8	58	26.3	48	21.8	20⅛	51.1	13⅝	34.6	10⅜	25.7
Do.....	12	2	25	710	29	13.2	23¼	10.5	18¾	8.5	19¼	48.9	13⅞	35.2	8⅛	20.6
Hamburger steak	24	½	5	140	19	8.6	12½	5.7	7½	3.4	15⅝	39.7	11⅜	28.9	4⅝	11.8
Do.....	24	1	12	340	30½	13.8	25	11.3	18	8.2	19⅛	48.6	13⅞	35.2	5⅜	13.7
Do.....	48	1	12	340	61½	27.9	50	22.7	36	16.3	19¼	48.9	14⅝	35.9	10⅜	25.7
Beefsteak and onions.....	24	1	16	450	35½	16.1	30¼	13.7	24	10.9	20⅝	51.1	13¼	33.7	5¼	13.3
Do.....	24	2	25	710	55	24.9	47	21.3	37½	17.0	19⅜	48.6	13⅞	35.2	8⅛	20.6
Irish stew.....	24	1	16	450	35	15.9	30	13.6	24	10.9	20¼	51.4	13¼	33.7	5⅛	13.0
Do.....	24	2	25	710	54¼	24.6	47½	21.5	25	11.3	19⅛	48.6	13⅞	35.2	8¼	21.0
Tripe.....	24	1	15	425	35¼	16.0	29	13.2	22½	10.2	20⅛	51.1	13¼	33.7	5⅛	13.0
Do.....	48	1	15	425	70	31.8	58	26.3	45	20.4	20¼	51.4	13½	34.3	10	25.4
Do.....	24	2	24	680	56¼	25.5	45	20.4	36	16.3	19¼	48.9	14⅜	36.5	8½	21.6
Do.....	12	2	24	680	27½	12.4	22½	10.2	18	8.2	19⅛	48.6	13¾	34.9	4⅜	11.1
Tamales, Mexican style....	24	1	8	225	20¼	9.2	16	7.3	12	5.4	16¾	42.5	10¾	27.3	5⅛	13.0
Do.....	12	2	16	450	19¾	9.0	14½	6.6	12	5.4	16¾	42.5	10⅞	27.6	5⅛	13.0
Do.....	24	2	16	450	38½	17.5	29	13.2	24	10.9	22⅝	57.5	14¾	36.5	5¼	13.3

Product.	Cans in case.		Net weight of contents of can.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds.	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Chili con carne with beans	24	½	5½	155	14	6.4	11¾	5.3	8¼	3.7	11¾	29.0	8½	21.0	5⅞	14.9
Do	24	1	12	340	25¼	11.5	21¼	9.6	18	8.2	17⅜	44.1	11½	29.2	4¾	12.0
Do	48	1	12	340	47½	21.5	42¼	19.2	36	16.3	17¾	45.1	11½	29.2	8¾	22.3
Do	24	2	17	480	36	16.3	31¼	14.2	25½	11.6	14⅞	37.8	11	27.9	8⅜	21.2
Chili con carne without beans	12	5	70	1,984	71	32.2	61	27.7	52½	23.8	20⅛	51.8	13½	34.3	10⅛	25.7
Chili con carne	24	½	5½	155	14	6.4	11¾	5.3	8¼	3.7	11¾	29.8	8¼	21.0	5⅞	14.9
Do	24	1	12	340	25¼	11.5	21¼	9.6	18	8.2	18	45.7	11½	29.2	4⅝	11.8
Do	48	1	12	340	47	21.3	42	19.1	36	16.3	17¾	45.1	11½	29.2	8⅞	22.5
Do	24	2	17	480	36	16.3	31¼	14.2	25½	11.6	14⅞	37.8	11	27.9	8½	21.6
Do	12	5	71	2,010	72	32.7	60¾	27.3	53¼	24.2	20¼	51.4	13⅞	35.2	10⅜	26.4
Stewed kidneys	24	1	16	450	35½	16.1	29½	13.4	24	10.9	20⅛	51.1	13⅛	33.3	5⅛	13.0
Do	48	1	16	450	72	32.7	59	26.8	48	21.8	20¼	51.4	13½	34.3	10⅛	25.7
Do	24	2	24	680	54¼	24.6	47¾	21.7	36	16.3	19⅛	48.6	13¾	34.9	8⅛	20.6
Liver and bacon	24	1	14	395	33	15.0	28	12.7	21	9.5	13¼	33.7	10	25.4	8⅝	21.9
Ox marrow	48	1	14	395	64¾	29.4	54	24.5	42	19.1	20⅛	51.1	13½	34.3	10	25.4
Do	24	2	23	750	51	23.1	43	19.5	34½	15.6	19¼	48.9	13⅞	35.2	8⅜	21.3
Do	6	14	221	6,205	115¾	52.5	93	42.2	82⅞	37.6	28¼	71.8	18½	47.0	10½	26.7
Beef dripping	24	1	14	395	33½	15.2	27	12.2	21	9.5	20¼	51.4	13¼	33.7	5⅛	13.0
Do	48	1	14	395	65	29.5	54	24.5	42	19.1	20⅛	51.1	13½	34.3	10	25.4
Do	24	2	23	750	51	23.1	43	19.5	34½	15.6	19¼	48.9	13⅞	35.2	8⅜	21.3
Chop suey	12	1	14	395	16	7.2	13	5.9	10½	4.8	13¾	34.9	10	25.4	4⅝	11.8
Do	24	1	14	395	30¾	13.9	26	11.8	21	9.5	14⅜	35.9	10	25.4	8⅝	21.9
Oxtails in jelly	24	2	27	765	56½	25.6	49	22.3	40½	18.4	19⅛	48.6	13⅞	35.2	8¼	21.0
Boneless chicken	12	½	6½	185	9¼	4.2	7¼	3.3	4⅞	2.2	11	27.9	7¾	19.7	4¾	12.1
Do	24	½	6½	185	17¼	7.8	14¼	6.5	9¾	4.4	14½	36.8	10¼	26.0	4¾	12.1
Do	12	1	12½	355	15¾	7.4	13	5.9	9⅜	4.3	13¾	34.9	8⅞	22.5	5½	14.0

Do	24	1	12½	355	30¾	13.9	26	11.8	18¾	8.5	18	45.7	13	33.0	5½	14.0
Potted chicken, genuine	24	1	4½	125	14	6.4	11	5.0	6¾	3.1	14	35.6	10⅞	27.6	4⅜	10.5
Do	12	½	9	255	12½	5.7	10	4.5	6¾	3.1	12⅛	30.8	10⅞	27.6	4½	11.4
Deviled ham, genuine	24	¼	3½	100	13¼	6.0	11	5.0	5¼	2.4	14	35.6	10⅞	27.6	4⅜	10.5
Do	12	½	7½	210	12¼	5.6	9	4.1	5⅝	2.6	12	30.5	10¾	27.3	4¼	10.8
Potted ham, genuine	24	¼	3½	100	13½	6.1	11	5.0	5¼	2.4	14	35.4	10⅞	27.6	4½	11.4
Do	12	½	7½	210	12¼	5.6	9	4.1	5⅝	2.6	12⅛	30.8	10⅞	27.6	4¼	10.8
Assorted genuine potted and deviled ham and chicken	24	¼	.....	.....	13¼	6.0	10½	3.9	5⅝	2.6	13⅜	35.2	10¾	27.3	4⅞	10.5
Do	48	½	.....	.....	28	12.7	21	9.5	11¼	5.1	15⅝	39.7	11⅜	28.9	8	20.3
Potted beef	24	½	5¾	165	13½	6.1	11¼	5.1	8⅝	3.9	11¾	29.8	8⅜	21.3	5¾	14.6
Do	48	¼	3¼	90	17	7.7	14¾	6.4	9¾	4.4	11½	29.2	11⅜	28.3	5½	14.0
Deviled meat	48	¼	3¼	90	16¾	7.6	14	6.4	9¾	4.4	11½	29.2	11⅜	28.3	5½	14.0
Do	24	½	5¾	165	14	6.4	11	5.0	8⅝	3.9	11¾	29.8	8¼	21.0	5⅞	14.9
Assorted potted and deviled meat, same as deviled meat.																
Corned beef hash	24	½	5	140	15¼	6.9	12	5.4	7½	3.4	14½	36.8	10½	26.7	4½	11.4
Do	48	½	5	140	30	13.6	24	10.9	15	6.8	14⅝	37.2	13⅝	34.6	6⅜	16.2
Do	24	1	11	310	28½	12.9	22½	10.2	16½	7.5	17⅞	45.4	13	33.0	5⅜	13.7
Do	48	1	11	310	56	25.4	45	20.4	33	15.0	18⅛	46.0	13⅛	33.3	10¼	26.0
Do	12	2	28	795	31½	14.3	26½	12.0	21	9.5	19⅞	50.5	14⅝	37.2	4⅞	12.4
Do	24	2	28	795	62	28.1	52½	23.8	42	19.1	20	50.8	15	38.1	9⅜	23.8
Do	12	6	94	2,665	94½	42.9	81	36.7	70½	32.0	25½	64.7	19	48.3	8	20.3
Planter's hash	24	½	5	140	15¾	7.1	12	5.4	7½	3.4	14½	36.8	10½	26.7	4⅜	11.1
Milk, evaporated	72	.....	6	170	39½	17.9	33	15.0	27	12.2	16¾	42.5	10⅝	27.0	8⅜	21.4
Do	48	.....	12	340	49½	22.5	43	19.5	38	17.7	19⅝	49.9	12¾	32.4	7⅝	19.4
Do	48	.....	16	450	65	29.4	57¼	26.0	48	21.8	19⅝	49.9	12⅞	32.7	9¾	24.8
Do	24	.....	32	905	64	29.0	57	25.9	48	21.8	18	45.7	13⅛	33.3	10⅜	26.4
Do	6	.....	128	3,630	61½	27.9	53	24.0	48	21.8	19⅞	50.5	13	35.0	9	22.9
Milk, condensed	48	.....	11	260	44½	20.2	38¼	17.3	33	15.0	17⅝	44.8	11½	29.2	7⅝	19.4
Do	48	.....	12½	355	50½	22.9	45	20.4	37½	16.8	18⅝	47.3	12⅛	30.2	7¾	19.7
Do	48	.....	14	395	55½	25.2	49	22.3	42	19.1	19⅝	49.9	12¾	32.4	7½	19.1
Plum pudding	24	½	5	140	14	6.4	11¼	5.1	7½	3.4	13⅜	34.0	9½	24.1	4⅜	11.1

PRODUCTS PACKED IN TIN—Continued.

Product.	Cans in case.		Net weight of contents of can.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds.	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Plum pudding	12	1	14	395	18¼	8.3	13¾	6.2	10½	4.8	15½	39.4	10⅜	25.7	5¼	13.3
Do	24	1	14	395	34¾	15.8	27½	12.5	21	9.5	20⅝	51.1	14½	36.8	5¼	13.3
Do	12	2½	31	880	35½	16.1	29	13.2	23¼	10.6	19¼	48.9	12½	31.8	7	17.8
Do	24	2½	31	880	71	32.2	57¾	26.2	45	20.4	24⅝	62.5	18½	47.0	7¼	18.4
Soup, concentrated	48	1	10½	300	50⅛	22.7	42¼	19.1	35½	16.1	18½	47.0	12	30.1	8¾	22.2
Do	6	10	112	3,175	57¼	25.9	48⅞	22.1	44⅜	20.1	20½	54.6	13¼	33.7	7⅞	20.0
Soup	48	1	8	225	36	16.2	32	14.5	24½	11.1	16	40.6	11¼	28.6	7¼	20.0
Do	24	2	16	455	37	16.8	33	15.0	24½	11.1	20¼	51.4	13	33.0	10¼	26.0
Do	24	3	32	905	70	31.7	63	27.6	50	22.7	19	48.3	14	35.6	11¼	28.6
Do	6	10	100	2,830	55	24.9	44	19.9	40	18.4	20½	54.6	13¼	33.7	7⅞	20.0

FRUIT PRODUCTS PACKED IN GLASS.

Fruit products.	Jars in case.		Net weight of contents of jar.		Gross weight of case.		Legal weight of case.		Net weight of contents of case.		Length of case.		Width of case.		Height of case.	
	Number.	Size.	Ounces.	Grams.	Pounds.	Kilos.	Pounds	Kilos.	Pounds.	Kilos.	Inches.	Centimeters.	Inches.	Centimeters.	Inches.	Centimeters.
Fruits	12	32	33	935	55	24.9	45	20.4	26	11.8	18 7/8	47.9	14 5/8	37.0	8 5/8	21.9
Do	12	28	28	795	52	23.6	42	19.0	23	10.4	16 7/8	42.9	12 1/2	31.8	11 5/8	29.5
Do	12	26	24	680	46	20.8	37	16.8	20	9.0	17 1/2	44.5	13 1/2	34.3	8 1/2	21.6
Preserves, jams, and jellies	24	16	15	425	52	23.6	44	19.9	24	10.9	20	50.8	13 1/2	34.3	7 3/8	18.1
Do	48	10	8	227	65	29.5	50	22.7	25	11.3	21 3/8	53.7	14 1/2	36.8	9 1/2	24.6
Do	48	6	6	170	47	18.2	37	16.8	18	8.1	18 1/4	47.6	12 1/4	31.1	9 1/2	24.1
Olives in jars	72	4	2 1/4	65	58	26.3	46	20.8	12	5.4	18 1/4	46.4	11 3/4	29.8	10 1/4	26.0
Cherries in bottles	12	27	27	770	50	22.6	40	18.1	23	10.4	16 1/2	41.9	12 1/4	31.1	11 1/2	29.2
Do	24	12	12	340	54	24.5	39	17.7	18	8.2	22 1/4	56.5	13 3/8	34.0	9	22.9
Cherries, maraschino style	48	6	6	170	58	26.3	40	18.1	18	8.2	22 1/4	56.5	16 1/2	41.9	7 1/2	19.1
Do	48	4	4	110	46	20.8	32	14.5	12	5.4	20	50.8	14 3/4	37.5	6 3/4	17.1
Ketchup in bottles	12	32	30	850	60	27.2	39	17.7	22	10.0	16 1/2	41.9	14 5/8	37.2	12 1/2	31.8
Do	24	16	15	425	65	29.4	40	18.1	23	10.4	20 3/4	52.7	13 3/4	34.9	11 3/4	29.8
Do	24	8	7	200	37	16.7	21	9.5	11	5.0	17 3/8	44.0	11 1/2	29.2	9 3/8	23.8

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